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# ***JPRS Report***

# **Science & Technology**

***USSR: Life Sciences***

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# Science & Technology

## USSR: Life Sciences

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19 November 1991

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**Law of the USSR on Health and Environmental Protection as Related to Use of Pesticides, Plant Growth Regulators and Mineral Fertilizers in the National Economy**

917C0368A Moscow ZASHCHITA RASTENIY  
in Russian No 11, Nov 90 (signed to press 16 Oct 90)  
pp 16-17

[Draft<sup>1</sup> published under the rubric "Problems, Research, Opinions"]

[Text]

**Section I. General Statutes**

Article 1. This Law is called upon to assure protection of man and the environment against the potential deleterious effects of pesticides, plant growth regulators and mineral fertilizers during their manufacture, transportation, storage and use.

Article 2. Protection of plants against pests, diseases and weeds is a national mandatory measure for all land owners and land users, and it is aimed at recovering a guaranteed harvest of agricultural crops, reducing loss and improving their quality.

Article 3. Measures for plant protection are carried out under the supervision of specialists in plant protection in accordance with the Regulations for Plant Protection approved by the USSR Council of Ministers.

**Section II. State Testing and Registration of Pesticides and Plant Growth Regulators**

Article 4. Pesticides and plant growth regulators proposed for use in agriculture undergo state testing for biological, toxicological, hygienic and ecological evaluation, and must be registered if positive results are obtained.

Article 5. State testing is aimed at providing an assortment of pesticides and plant growth regulators that are safe to human health and the environment; they are carried out in accordance with the "Statute on State Testing of Chemical and Biological Agents for Control of Pests, Plant Diseases and Weeds, and Plant Growth Regulators" approved by the USSR Council of Ministers.

Article 6. Registration remains in effect for five years, after which the agents must be reregistered. Registration of a pesticide or plant growth regulator may be canceled or suspended before the above time has elapsed if new data about its hazard are received.

Article 7. Agents subject to registration are included in the "List of Chemical and Biological Agents for the Control of Pests, Plant Diseases and Weeds, and Plant Growth Regulators Allowed for Use in Agriculture," approved by the State Food and Purchasing Commission of the USSR Council of Ministers, USSR Ministry of Health and USSR State Committee for Environmental Protection.

Article 8. It is forbidden to produce, purchase abroad and import into the USSR of pesticides and plant growth regulators for the purpose of production testing and use, unless they have undergone registration in the USSR.

Article 9. Ministries, agencies and enterprises developing and producing new pesticides and other biologically active agents must provide for timely development of methods of identifying these agents in agricultural products, fodder, foodstuffs and environmental objects, methods of decontaminating and disposing of agents that are no longer fit for use, as well as their containers.

**Section III. Toxicological and Hygienic Evaluation of Pesticides and Plant Growth Regulators**

Article 10. Toxicological and hygienic evaluation of pesticides and plant growth regulators is carried out in order to determine safe residual levels of such agents in agricultural products, fodder, food and environmental objects, as well as regulations on their safe use and production.

Article 11. Scientific institutions of our country that have been certified by the USSR Ministry of Health are allowed to carry out toxicological and hygienic studies.

**Section IV. Steps for Protection of Public Health During Production and Use of Pesticides, Plant Growth Regulators and Mineral Fertilizers**

Article 12. The location of plants producing pesticides, plant growth regulators and mineral fertilizers must conform to existing USSR legislation.

Article 13. Enterprises producing pesticides, plant growth regulators and mineral fertilizers must guarantee the output and delivery of products conforming to established specifications.

There must be inscriptions on containers for pesticides, plant growth regulators and mineral fertilizers indicating the purpose of the contents, how they should be stored and used, shelf life, toxicological-hygienic properties, precautions when working with them and first aid in case of poisoning.

Article 14. The manufacturer monitors output of pesticides, plant growth regulators and mineral fertilizers, as well as their conformity to existing standards. State inspection is implemented by the USSR State Committee for Control of Product Quality and Standards.

Article 15. Enterprises, organizations' land owners and land users that apply pesticides, plant growth regulators and mineral fertilizers must provide for the following:

- transportation, storage and records of amounts of pesticides, plant growth regulators and mineral fertilizers used in accordance with existing standards and rules;
- training personnel on rules for using pesticides, plant growth regulators and mineral fertilizers, as well as safety practices when working with them;
- appropriate conditions for safe use of pesticides, plant growth regulators and mineral fertilizers;
- work to be carried out in accordance with approved regulations (standards for dosage, frequency and term of treatment, targeted plants, time when people are allowed to care for crops in treated areas, adherence to health-protective zones, etc.).

Article 16. It is allowed to store pesticides, plant growth regulators and mineral fertilizers only in warehouses that have been specially equipped in accordance with hygienic and construction standards. Pesticides, plant growth regulators and mineral fertilizers can be transported only in specially equipped vehicles or in special containers.

Article 17. Use of chemicals for plant protection in individual farms is permitted in accordance with the list of pesticides allowed for sale to the public, approved by the USSR Ministry of Health or ministries of health of Union republics.

Article 18. Each USSR citizen is entitled to receive information available in State agencies, enterprises and organizations concerning levels of nitrates, residual pesticides and plant growth regulators in farm products, fodder and foodstuffs, maximum permissible concentrations of nitrates, pesticides and plant growth regulators in environmental objects.

Article 19. Organizations, enterprises, farms and cooperatives must provide for medical examination of those working in contact with pesticides, plant growth regulators and mineral fertilizers, and they must prohibit employment of individuals who have not undergone a medical examination or for whom such work is contraindicated for health reasons.

#### **Section V. Monitoring Use of Pesticides, Plant Growth Regulators and Mineral Fertilizers, Their Residual Levels in Agricultural Products, Fodder, Foodstuffs and Environmental Objects**

Article 20. State monitoring of nitrates, residual pesticides and plant growth regulators in farm products, fodder, foodstuffs and environmental objects is carried out by the USSR State Committee for Control of Product Quality and Standards, USSR State Committee for Hydrometeorology, and USSR Ministry of Geology.

Article 21. The State Sanitary and Epidemiological Service of the USSR Ministry of Health and ministries of health of Union republics implement State sanitary oversight of adherence to sanitary standards, rules and hygienic standards at farms, enterprises, cooperatives, officials and citizens when using pesticides, plant growth regulators and mineral fertilizers, as well as spot checks of their residual levels in food, drinking water and environmental objects.

Article 22. Agency-level oversight of adherence to hygienic standards and regulations for use of pesticides, plant growth regulators and mineral fertilizers, as well as levels of nitrates, residual pesticides and plant growth regulators in farm products, fodder and environmental objects is implemented by plant protection stations and planning-research stations dealing with use of chemistry in agriculture.

Article 23. The USSR State Committee for Statistics keeps statistical records on production, delivery and use of pesticides, plant growth regulators and mineral fertilizers in the national economy.

#### **Section VI. Responsibility for Infractions of Standards and Rules in Production, Transportation, Storage and Use of Pesticides, Plant Growth Regulators and Mineral Fertilizers**

Article 24. Enterprises that produce pesticides, plant growth regulators and mineral fertilizers bear administrative and criminal responsibility for conformity of their products to manufacturing specifications.

Article 25. Ministries, agencies, enterprises, farms, cooperatives, officials and citizens failing to adhere to regulations for transportation, storage and use of pesticides, plant growth regulators and mineral fertilizers must provide compensation for the material loss related to loss of good health, as well as repayment to medical institutions for expenses of treatment and implementation of sanitary and hygienic measures.

Article 26. Manufacturers of the products are responsible for the safety of raw materials produced in our country, while organizations and citizens purchasing them abroad are responsible for imported raw materials.

The quality of agricultural products, fodder and foodstuffs is certified in the form of a certificate that confirms the conformity of levels of nitrates, residual pesticides and plant growth regulators to the safe levels following the procedure established by the State Food and Purchasing Commission of the USSR Council of Ministers and USSR Ministry of Health.

Article 27. Individuals guilty of contaminating farm products, fodder, food and environmental objects with pesticides, plant growth regulators and mineral fertilizers in excess of the established standards, those who used pesticides and mineral fertilizers that had not undergone toxicological and hygienic evaluation or banned by State health inspectorate agencies, as well as those who sell raw material and products containing nitrates, residual amounts of pesticides and plant growth regulators in excess of standard levels are subject to criminal, economic and disciplinary responsibility.

#### **Footnote**

1. This draft of a law prepared by prominent scientists and specialists is being published for the purpose of discussion. Your comments and suggestions will be forwarded to the Main Administration of the State Inspectorates of the State Food and Purchasing Commission of the USSR Council of Ministers © COPYRIGHT VO "Agropromizdat", "Zashchita rasteniy", 1990

**Timely Biomedical Aspects of Toxoplasmosis in the Moldovan SSR**

917C0389E Kishinev ZDRAVOOKHRANENIYE  
in Russian Vol 6, Nov-Dec 90 (manuscript received  
20 Jul 90) pp 52-53

[Article by Ye. V. Mikhnevich, K. A. Andriutsa and I. Z. Kastravets, Department of Infectious Diseases (director—Prof K. A. Andriutsa), Kishinev Medical Institute imeni N. A. Testemitsanu; Parasitology Laboratory (director—Candidate of Biological Sciences I. Z. Kastravets) of the Institute of Zoology and Physiology of the Moldovan SSR Academy of Sciences]

UDC 616.993.192.1-036.2+614.2+619(478)

[Text] It has now been established that the toxoplasmosis invasion is widespread and continues to play a noticeable role in global invasive pathology in animals and man. It is usually encountered as a latent invasion (as a concealed form of disease, or in a parasite carrier), but it may also manifest itself in an acute (severe), clinically expressed form of disease in man and animals, with affliction of various organs and body systems [7,8,9,10,12].

Toxoplasmosis is classified among the so-called opportunistic infections, which develop into disease when the body's immune status is disturbed. Toxoplasmosis in patients with immune deficiency is becoming a life-threatening illness. It is especially timely today in connection with the rapid increase in the number of persons infected with human immune deficiency virus (HIV) and growth of the incidence of HIV infection.

Toxoplasmosis has important significance to the Moldovan SSR, where in comparison with other regions of the USSR, the highest level of carriers of hepatitis B and delta virus [1,3,6], which elicit various degrees of immune deficiency in patients and which produce marginal pathology, is noted. These facts, and the unsatisfactory social and hygienic background (extensive use of pesticides and mineral fertilizers, consumption of alcohol, and others), which also leads to immune deficiency, can be responsible for the higher frequency of toxoplasmosis than in other regions of the country. We also need to consider the more frequent contact of the republic's population with the soil, presence of large livestock complexes and privately owned animals, and the population's consumption of meat products that have not undergone sufficient heat treatment.

Thus the medical, biological and veterinary aspects of toxoplasmosis are closely interrelated, and they must be approached comprehensively.

In 1984 the Moldovan SSR established the Republic Consultative and Diagnostic Center for Toxoplasmosis at the clinical infection hospital of the Moldovan SSR Ministry of Health and the infectious disease department of Kishinev Medical Institute. The methodological recommendations they developed in regard to examining persons suspected of toxoplasmosis lay the responsibility of initial examination of adults on infection specialists, and of children on pediatricians; such examination must include specific tests run in four centralized serological laboratories in the republic. In

order to establish the final diagnosis, persons suspected of the disease are sent to the toxoplasmosis center, where immunological reactions—the complement fixation reaction, the RNIF [not further identified], the toxoplasmin skin test—are used in addition to clinical and epidemiological indicators. When specific organs are afflicted by toxoplasmosis, patients are sent to the corresponding specialists for treatment (neuropathologist, oculist, infection specialist, obstetrician-gynecologist, etc.).

The most timely biomedical aspects of the toxoplasmosis problem in the Moldovan SSR are:

1. Implementing comprehensive measures that would help to increase the awareness of toxoplasmosis among physicians and middle-grade medical personnel by including material on this problem in the study plans of specialized departments providing instruction to students of the physician advanced training faculty of Kishinev Medical Institute.
2. Organizing early diagnosis of toxoplasmosis both in the prehospital stage and in hospital departments irrespective of their clinical profile. This requires including toxoplasmosis diagnosis more frequently in differentiated diagnosis, and use of a complex of clinical, epidemiological and laboratory research methods.
3. Improvement of the quality of laboratory diagnosis of toxoplasmosis in the republic must proceed along the lines of introducing new, more highly sensitive quantitative methods of immunodiagnosis and diagnostic preparations of higher quality.
4. Revealing the causes of development of toxoplasmosis primarily by diagnosing toxoplasmosis invasion in patients with immune deficiency, including in the presence of viral hepatitis, and studying the immune and genetic status of toxoplasmosis patients.
5. Mandatory examination of all detected toxoplasmosis patients for HIV infection.
6. Prompt examination of women in women's pregnancy counseling centers, and then in the early stages of pregnancy, so that adequate measures could be implemented. In order to provide qualified therapeutic and diagnostic assistance to pregnant women with toxoplasmosis, it would be suitable to single out a toxoplasmosis consultant out of the staff of the obstetric-gynecological service in the republic.
7. Including the veterinary faculty of Kishinev Agricultural Institute in the study plans, and the parasitology laboratory of the Moldovan SSR Academy of Sciences and the republic's practical veterinary-bacteriological laboratories in the plan for scientific research.
8. Conducting joint meetings and conferences of medical and nonmedical interested scientific societies (of protozoologists, infection specialists, obstetrician-gynecologists, pediatricians, psychiatrists, ophthalmologists, neuropathologists, veterinarians), and periodic republic and regional seminars on toxoplasmosis.



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## Environmental Pollution in Soviet Georgia

917C0398C Tbilisi SOOBSHCHENIYA AKADEMII  
NAUK GRUZINSKOY SSR in Russian Vol 140 No 1,  
Jan 91 (manuscript received 7 Sep 90) pp 77-80

[Article by K. A. Tavartkiladze and E. V. Sadzhaya, Geography Institute imeni Vakhusti Bagrationi, Georgian SSR Academy of Sciences]

UDC 551.510.42

[Abstract] The changes in atmospheric pollution in five cities in Soviet Georgia (Sukhumi, Senaki, Telavi, Anaseuli, and Tsalka) as measured by the aerosol optical density from 1969 through 1985 were investigated to determine their effect on the formation of physical atmospheric parameters. The results demonstrated that the region is gradually becoming more polluted, with the peak in pollution noted in 1983-1984 attributed to the eruption of the El Chichon volcano in Mexico in 1982. Indicators such as relative humidity, water vapor pressure, wind speed, diffuse radiation, amount of fallout, average monthly temperatures, and maximum air temperature were measured in these five cities during the four seasons of the year in an attempt to find a correlation between physical atmospheric parameters and atmospheric pollution. The findings indicated that the greater the wind, the lesser the pollution, especially during the warmer seasons of the year. Figures 1; tables 1; references 4: Russian.

### Methodological Aspects of Medical Service Activity During Emergencies

917C0384A Moscow VOYENNO-MEDITSINSKIY  
ZHURNAL No 11, Nov 90 pp 11-13

[Article by P. P. Korotkikh, major-general of medical service, and Ye. V. Reshetnikov, doctor of medical sciences and colonel of medical service]

UDC 614.8.028.4:356.33

[Text] The complex and enormous work performed during recovery efforts in wake of the earthquake in Armenia convincingly illustrated the important role of the medical service not only in this emergency, but also in any other emergency. However, even with a superficial comparison of the activities of Army medics during events such as those in Ashkhabad, Tashkent, and Chernobyl, with all of the differences in these emergencies, we see a perfectly clear similarity in the organizational and tactical models, as well as in the same types of mistakes and errors that are repeated. Since this is so, we need to look for the sources of these errors among the fields of the methodology itself for training for natural disasters, rather than among the various subjective factors.

Let us imagine the most simplified form of a logical model of the beginning of this situation and the actions of medical service in it. Generally, there is a completely unexpected turn of events (earthquake, explosion, fire, flood, etc.). There is no need to describe the conditions perfectly when, with an extreme shortage of time, the administrative agencies (from the local government agencies and military command) and subunits begin to collect for aiding in the recovery from the emergency. A multi-faceted task faces the administrative agencies: They must develop a strategy and tactics of action, prepare a plan of basic measures, formulate the respective subunits, coordinate their efforts, resolve problems of equipment supply, problems of transportation, accommodations, etc., as quickly as possible. Moreover, it is difficult to estimate whether the personnel of the subunits that have been formed will be capable of immediately understanding the situation without preliminary training, whether they have the skill of removing the victims, carrying and transporting them from the accident, triage under conditions of possible cases of unknown pathology, rendering emergency medical assistance and evacuation in conditions of the large-scale arrival of wounded and ill. Furthermore, medical teams and subunits called up in emergencies cannot even be discussed, since we know that a rather prolonged time is needed for harmony to be reached in their work.

It is completely clear that this model of the onset of an emergency and the logistics of reaction to it at the height of the emergency is unavoidably tied to losses of time due to organizational muddles and omissions. The final result of all of this is the cost of human lives. Evidently, the point here is that the disaster itself cannot be foreseen. But a certain danger of methodological error—"emergency" reaction to the situation—is hidden in this unpredictability in addition to the direct danger. In essence, there is a mnemonic translation of the meaning of the term to the essence

of the situation. Perhaps, the reason for the developing stereotype of actions in catastrophes lies in this.

Can efforts for recovery in the wake of a disaster be planned beforehand, thereby avoiding the fatal need for "feverish" solutions and actions for coping with them? This question seems paradoxical only at first glance. It is true that catastrophes cannot generally be predicted. We cannot guess the time, precise scales, and severity of it. But does this prevent the scientific prognosis and development of a basic concept, and based on them, the preliminary planning of the medical service activity in case of the actual development of events? In no way.

Competent analysis of the natural climatic and socio-economic aspects of a region make it possible to predict the probability of the occurrence of a disaster with a degree of reliability sufficient for obtaining basic data and parameters, and consequently plan for the primary events for recovery. In addition, if we consider the rayons with heightened seismic activity, danger of avalanches, frequent floods, etc., then following the prognosis of the nature of the emergency and scales of the disaster, there should not be any particular problems. However, there are variables that make prediction more difficult. These include, for example, the need to identify in a major industrial rayon with a highly developed infrastructure those buildings that are most at risk for the occurrence of a disaster. Its possible serious consequences can be identified with sufficient basis for the computer to predict the problems. The data that can be obtained as a result of the analysis and prediction can be illustrated in the following schematic example.

During an investigation of the climatic and socio-economic conditions in garrison X, it was established that the chemical plant was the most likely place for a disaster to occur. It was situated in a microrayon of the city with a population of 80,000 people. The plant produces mineral fertilizers. The raw materials are compounds based on phosphoric and sulfuric acids and ammonia. The probable nature of the injuries to people would be chemical burns and inhalation poisoning. The probable number of casualties: 10,000 people. The distance from the plant to the garrison army hospital is 10 km. The garrison is able to allocate the following manpower and resources of medical service for resolving the primary tasks in case of an accident at the plant. And so on. That is, a logical model of a possible emergency is developed. There may be several installations "at risk" in the garrison, and so the respective number of models would be developed.

Producing a scientifically based prognosis of the probable occurrence of a disaster makes it possible to develop a completely different concept about the organization of measures for recovery from any catastrophe. Prompt planning of the work and purposeful, planned training of all the links of medical service and the personnel of rescue subunits in case of an accident, natural disaster, etc., should underlie this concept.

Consequently, from the position of this concept, the process for planning and training the district (garrison) medical service for cleaning up the aftermath of a possible accident looks like this:



1. Analyze the climatic and socio-economic factors of the region and identify the respective risk factors.
2. Use a logical model, sometimes with the aid of a computer, to predict the nature and scale of recovery from the emergency.
3. Plan the activity of the medical service during the training period and during clean-up of the catastrophe.
4. Train the administrative agencies, medical service subunits, and personnel of the rescue teams for efforts in the emergency.
5. Develop the necessary equipment stores.

The Soviet Armed Forces Medical Service has modern equipment that is supported by simulation of complex probable situations. And in connection with this, it seems paradoxical that, with rather thorough development of the scientific methodology for simulating medical service activity in different variations in the beginning and follow-through of possible military actions in case of outside aggression, the aspects and scales of which are purely hypothetical, techniques for simulating emergencies in peacetime and predicting their possible aftermaths have not at all been developed. At the same time, the earthquake in Armenia demonstrated the degree of urgency for scientific research in this field.

The plan of medical service actions that is being developed based on logical simulation is a component part of the total coordinated plan for the district (garrison). Its most important component is harmony of the basic tenets of the plan with the interested services, local public health agencies, and civil defense medical service. The plan should encompass the training period and period of direct involvement in the clean-up. The chief tasks of the training period are:

- organizing mutual efforts with the services involved;
- permanent verification of the plan of action in an emergency;
- training medical service and rescue subunit personnel in rendering medical assistance in these conditions;
- training administrative agencies and coordinating the medical service subunits;
- developing equipment stores.

The plan for medical service involvement in the clean-up of the accident, natural disaster, etc., in our opinion, must include the following:

- the basic tasks of medical service in an emergency;
- composition of the manpower and resources to be used in the recovery;
- organization of rendering medical assistance to the victims and their medical evacuation;
- hygienic and anti-epidemic measures;
- organization of medical equipment supply;
- control, interaction, and communication.

The contents of the sections of the plan do not need any special explanation; the medical service directors know them well. We need to dwell only briefly on the second section. Since it is impossible to predict and establish beforehand the probable scales of the catastrophe and considering its suddenness, it is a good idea to outline in the plan the composition of the manpower and resources for resolving the primary tasks directly after the emergency has occurred. Of course, the manpower and resources must come from the units that are at permanent readiness. This section also includes the augmentation of manpower and resources as the scales of the disaster become clear.

It is easily seen that this plan does not essentially differ in content and structure from the medical service plan for supporting combat actions of the troops. This has vital significance—such an approach does not violate the principle of goal-oriented planning and organization of combat and special training of the medical service.

The problem of training the military medical establishments, units, and subunits for actions in an emergency, in spite of the obvious need, also requires some commentary. Unfortunately, the stereotype of reacting to an emergency urgently also determines the approach to training the personnel.

The preparedness of the medical service for these actions is very closely associated with its daily activity in rendering medical assistance, especially urgent care, in the garrison, and is in essence its logical extension. All of this corresponds to tasks and the program of training the service for working in a situation of suddenly developing combat actions, when at the beginning of the war the crew uses the peacetime manpower and resources available in the garrison. In other words, improving the skills of activity in peacetime catastrophe conditions does not upset the course of combat and special training of the medical service and does not require significant additional time.

The technique for preparing for actions in an emergency includes the entire arsenal of known methods:

- practical training for rendering medical assistance to "victims";
- departure of medical teams along probable routes to the installation;
- rendering assistance at the site, during evacuation, in the medical company (battalion), and in the military hospital;
- tactical drills in the physician team and medical subunit;
- solution of situational tasks (role-playing);
- training the garrison medical service to work through a series of outlined tasks.

The stores of medical property with respect to the prognosis of the scales and nature of the emergency should ideally be compiled based on a calculation of the primary needs and with consideration of the aspects of probable pathology. The supplies should be stored at the medical establishments under the required conditions, and they should be used

promptly and replenished. In addition to the medical equipment, domestic items should also be stored to provide for full autonomy in the work of the medical formations designated to participate in the recovery work of the catastrophe in peacetime (foodstuffs and other materials, means for delivering and storing water, fuel, etc.).

In conclusion, we would like to once again emphasize that the pathway to improving the organization of medical support to the troops and public in emergencies lies within its methodology. The detailed development of this methodology and, most importantly, its practical realization—the planning and prompt, goal-oriented training of the district (garrison) medical service for providing a high level of preparedness to execute tasks in any situation—are absolutely essential. Such an approach is in complete harmony with the work that has begun in this country of creating a rapid response system to emergencies. © COPYRIGHT "VOYENNO-MEDITSINSKIY ZHURNAL", 1990

### Psychological Disorders in Emergency

917C0384B Moscow VOYENNO-MEDITSINSKIY  
ZHURNAL No 11, Nov 90 pp 14-16

[Article by Yu. G. Zubarev, candidate of medical sciences]

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[Text] A suddenly occurring situation characterized by significant socio-ecological and economic damage, with the need for evacuation and rescue work and cleaning up the negative sequelae is called an emergency. The destructive force of some natural disasters and technological catastrophes is comparable with military operations, while the number of victims depends on the type, scale, pace, location of the emergency, aspects of the enterprises, and other circumstances. Casualties are characterized by a large number of cases of psychological disorders of an acute, subacute, and remote nature (Yu. S. Golov, 1989; D. A. Dzhonson, 1989; V. N. Zavyalov, 1989; V. N. Kakusha, 1989). In the psychopathology in question that is observed as a result of emergencies, a number of initial tenets must be taken into account.

The relationship of social and biological factors in the genesis of mental diseases is complex and is subjected to dialectical mechanisms of development. The pathological changes induced by the effect of biological factors unalterably results in social dysadaptation of the patient and, vice versa, with the leading etiological role of the social factors in the process of the disease, cerebral structures and functions are unavoidably involved. The form itself of the psychological pathology is defined not only by the etiological factor, but also by the aspects of the personality and its biological, psychological, and social structures, that are its basic cause (A. V. Kvasenko and Yu. G. Zubarev, 1980). Depending on the nature of the interaction of these groups, various clinical and subclinical variables of psychological disorders occur. The extent of pre-illness psychological disorders among the public, according to data from various researchers, fluctuates from 22 to 89.7 percent.

Most people, though not all, have a constitutional predisposition to the development of these or other diseases. Its

expression is most likely in people with psychopathies and accentuated traits (latent forms of psychopathies and extreme variations of normal). There are also factors that attenuate the psychological sphere: emotional and physical stresses, prolonged monotonous activity or anticipation, forced inactivity, insufficient (or more rarely, excess) information, various deprivations (limitations), etc.

In emergencies, mechanisms of psychological protection (various types of reaction to a situation) are switched on in the victims. The primary forms of psychological disorders are abnormal (inadequate for the stimulus) reactions. Pathological conditions, syndromes, and disease develop as the reactions become more complicated. The reactions and conditions are characterized by rapid onset and disappearance, if the disease does not develop. Some psychological conditions have widespread epidemic properties, the so-called "psychological infection," with negative as well as positive emotions. The danger induced by abnormal reactions, pathological conditions, and illnesses may be real as well as imagined.

A person's behavior during a period of danger in many ways depends on the general level of his development and his education. Moreover, the greater the psychological traumatization, the lesser the significance of the personality factor. The means for expression in stressed conditions may be based more on previous experience and skills than on any individual factor. Almost all survivors of a catastrophe (disaster) will later suffer from psychological stress. The longer the psychological disorder, the more probable the transition into a subacute or exacerbated course of the illness.

Based on data from the earthquakes in Ashkhabad (1948), Skopl (1963), Tashkent (1966), Banya-Luga (Yugoslavia, 1969), and Armenia (1988), we found that "psychological horror" for two to 24 hours was found in almost all people, including some of those that arrived to offer help. Up to 10 percent of the residents in the earthquake zone needed urgent psychological care, while the entire population needed to take sedatives or tranquilizers. The reactive conditions lasted from five to seven days in 14-20 percent of the people, while prolonged illnesses were noted in 10 percent of the populace. Among the traumatized, the reasons for injury in 55 percent of them were incorrect, unconscious actions during the catastrophe stemming from fear and panic.

The psychological disorders in the first hours and days following the catastrophe are expressed by three types of conditions: excitation, inhibition, and a condition between the two. Excitation is characterized by elevated impressionability, watchfulness, tension, suspicion, anxiety, fear, horror (panic), and frenzy. Inhibition is characterized by tranquility, insensitivity, detachment, and stupor. The transitional condition is characterized by surprise, disbelief, bewilderment, concentration, and mass hysterics. Examples of this are two forms of psychological shock—erectile and stuporous, as well as panic. The erectile form of shock is expressed by excitation, aimless activity, restlessness, running reactions, including towards the danger. The stuporous form is characterized by apathy, detachment, and inactivity.

We know that panic encompasses a person or number of people and is expressed by an irrepressible, uncontrollable desire to avoid the hazardous situation. In a panic, the senses succumb to instincts. Other milder expressions of destructive (pathological) behavior that are observed in emergencies include: regressive (inadequate euphoria), primitive (senseless actions), and hidden (feverish, disorderly activity) forms of pathology. A wide scale of hysterical disorders (reactions and conditions) occupy the intermediate position: pseudodementia (feeble-mindedness), puerilism and infantilism (childishness, juvenilism), deaf-mutism, etc.

Milder psychosomatic reactions and other illnesses that are not always hazardous are more widespread in the affected area. They include: elevated arterial pressure, unconsciousness, nausea, vomiting, various spasms, sensations of heat and cold, convulsive twitching of the muscles, skin rashes, hypertensive crises, myocardial infarction, bronchial asthma attacks, cerebrovascular disorders, exacerbation of endocrine diseases, premature labor, etc. Those persons predisposed to or having various mental deviations may have acute or subacute psychotic disorders: reactive depressions, paranoia, hallucinations, epileptic attacks, etc.

In a situation of a mortal threat, during the last moments before death, not all people experience fear or horror (for example, when performing service duties, etc.). During examination of victims that were threatened with death, it was established that 72 percent of them had a syndrome of depersonalization, a disorder of personal consciousness, alienation from oneself, and loss of individuality (D. A. Dzhonson, 1989). In such conditions, there is a flood of strong feelings, sensations, and thoughts. The feelings and sensations may be contradictory, while thoughts "operate" on two different levels. On one level of consciousness, the victim tries to gain control of the critical situation and use his experience, while on the other level he somehow removes himself and observes the accident as if from the sidelines, as if the accident was happening to someone else.

We also find situations where the victims experience horror, and scenes from their own lives pass with unbelievable rapidity before their eyes. In this instance the person senses his split; it is as if someone else inside him is looking at photographs in his family album. According to data compiled by D. A. Dzhonson (1989), 72 percent of those screened reported sensations of a slowing of time. Time was being drawn out, while a string of events was passing in his consciousness. Among the survivors, 56 percent of those screened indicated slackened or complete absence of emotions during this period. They felt doomed and were in a state of peace or reconciliation. The authors concluded that depersonalization, like fear, is a very widespread reaction in this situation. This condition comes on immediately at the moment of understanding of the mortal danger and passes only when the threat does.

Thus, those persons with psychological disorders stemming from emergencies may be divided into three groups: those with psychological situational disorders (reactions of stress, anxiety, nervous demobilization, etc.) that are not as extensive as psychoses and that do not last more than a day (these

persons are not considered casualties), those with limited conditions, and those with psychological disorders.

The psychiatric fields of work for recovery from the sequelae of natural disasters and catastrophes outline medical and psychological support (psychohygiene and psychoprophylaxis) and rendering specialized assistance not only at the site of the disaster and at evacuation stages, but also in the remote (after several years) period.

The psychohygienic aspects include the morale and psychological preparation of the population, study and development of the tenets of self- and mutual assistance, control methods, support of operating capacity, knowledge of evacuation routes and gathering points for the victims, and restoration measures. Clear management is the most important of the psychoprophylactic measures. By this we mean: constant clarification of the situation; instruction on the best means of action; prompt assignment of tasks; getting people involved in their usual activities (removing the stress), and distracting attention from subjects that have a negative psychological effect; maintaining senses of duty, collectivism, and self-confidence at a high level and rendering support to groups and individuals that have fallen into difficulty; and personal example of courage, endurance, and discipline. It is permissible to gloss over the realities and maintain illusions and hopes in situations where the truth might worsen the situation. And vice versa, when the maximum amount of information is needed to avert additional stress caused by ignorance.

Practically the entire population that has experienced the catastrophe needs urgent psychiatric help. Furthermore, success is supported by acceptable positions (promptness) as well as by the level of the respective preparation of the population and medical personnel. The first stage—survival—lasts minutes. The second—rescue—lasts from one hour to days. The third—recovery—takes up to 10 or more days.

Urgent psychiatric care is offered directly at the site of the disaster, at gathering points, and during evacuation. The following groups of victims need psychiatric care: those with urgent, critical conditions (those presenting a hazard to their own health and life, as well as to the lives of those around them); those with multi-organ pathologies; and those with behavioral disorders that attract the attention of those around them (suddenness and rapid rate of development of psychotic disorders are typical). Urgent therapeutic measures include arresting the psychological disorders with prompt hospitalization. The stages of rendering assistance are: at the site, outpatient care at any medical establishment, as well as at the so-called semi-infirmaries (day infirmaries, night prophylactories, "day-night infirmary" complexes), and finally, at a specialized infirmary.

Assistance is rendered, first of all, at the disaster site to the "quiet" patients (by vital signs). They need peace and quiet, injections of symptomatic agents, and most careful evacuation. Among them there may be individuals with or without psychological disorders. Patients that are excited and panicking are isolated. The simplest methods for calming them are giving them the opportunity to express themselves (cry),

feeding them, and offering a sweet drink. We try to divert the attention of these individuals and interest them in work. Mechanical limitation by means of swaddling them with sheets or towels, strapping them to a stretcher or stool, etc., is acceptable. The majority of victims need to be given a sedative, tranquilizer, or sleep-inducing agent.

Patients with non-persistent or fragmentary psychological disorders, with the rapid reduction in acute psychopathological symptoms, with positive steps towards treatment and with favorable microsocial and behavioral steps are in the outpatient contingent. The semi-infirmaries expand the opportunity for offering urgent care outside the hospitals. They can treat patients with acute and subacute psychological conditions at relatively early stages of the illness, when the aspects of psychopathological picture and the course of the disease makes it possible to assume a rapid reduction in the acute symptoms. This includes mainly individuals with affective, affective-delirium and hallucinatory-delirium disorders, as well as victims with subpsychotic pathology, the offer of assistance to which in outpatient conditions is difficult due to a number of social and domestic circumstances that require temporary isolation from the traumatizing aspects of the situation.

Urgent evacuation to specialized infirmaries and wards for urgent therapy (resuscitation) is for victims with more serious forms of psychoses, multi-organ pathology, and serious psychological diseases with the high likelihood of developing socially hazardous actions (aggression and auto-aggression), with the lack of progress to the need for treatment, and for victims that cannot be given the proper supervision and care outside of the hospital, as well as for those that need extensive examination in the infirmary.

The victims are treated with consideration to their somatic condition and age. Aminazin, chlorprothixene, tiserцин, droperidol, haloperidol, trisedil, propazin, teralen, nepromil, sodium hydroxybutyrate, phenazepam, seduxen, etc., are used. Victims are evacuated to hospital bases equipped with psychological establishments and medical institutes in the area of the catastrophe as well as outside of it.

Due to the possibility of psychological destabilization such as the development of phobias, depression, psychosomatic and behavioral (personality) disturbances, most people that experience natural disasters, catastrophes, or accidents will need from one to five years of psychiatric observation.

Thus, the onset of psychological disorders due to emergencies depends on four groups of factors: the effect of the tragedy itself (nature, duration, possible recurrence, and degree to which sequelae can be controlled); status of the public's mental health (presence and expression of deteriorating psychological circumstances); training for action in emergencies (morale and psychological mood, self- and mutual assistance skills, rules for behavior in emergencies, etc.); and level of special training of medical personnel and supplies.

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- Urgent Problems of Organization and Development of Automated Control Systems in Military Therapeutic Establishments**  
917C0384C Moscow VOYENNO-MEDITSINSKIY ZHURNAL No 11, Nov 90 pp 17-20
- [Article by I. V. Sinopalnikov, Honored Physician of Uzbek SSR and General Lieutenant of Medical Service; L. A. Kozhemyakin, Professor and Colonel of Medical Service; Ye. Ya. Karpovskiy, Professor; V. V. Kostyushov, Candidate of Medical Sciences and Lieutenant Colonel of Medical Service; Ye. V. Kostyushov, Candidate of Medical Sciences and Lieutenant Colonel of Medical Service; I. A. Ruban, Lieutenant Colonel; G. M. Draznin, Lieutenant Colonel; O. L. Tymchishin, Captain of Medical Service; and A. A. Kryshaleva]
- UDC 615.471:681.3].03:356.33
- [Text] Novel data on the diagnostics, treatment, and prevention of diseases are accompanied by an increase in the information reaching physicians that is necessary for making well-founded decisions. Analysis and processing of the information is substantially facilitated with modern computers. The 1980s were marked by the development of a new generation of computer equipment resources (CER) and their introduction into medical practice (Ye. A. Popov, 1987). In analyzing published sources (V. S. Libenson, et al., 1984; V. V. Romanovskiy, 1988; G. N. Dyadyk, et al., 1989; A. M. Litvinov and Ye. V. Reshetnikov, 1989; S. Grams, 1984; G. H. Turner, 1984; and J. A. Mitchell, et al., 1985), it is easy to note that the Soviet Union is lagging with problems of applying CER to public health. In investigating the status of this matter in military medicine, it should be said that computers have only been introduced to the central military therapeutic establishments and some district and naval hospitals (V. P. Spichev, et al., 1987; D. M. Malinskiy, et al., 1988, etc.).
- Noteworthy are a number of studies on the application of computers beginning from the elementary calculation of algorithms and ending with the development of automated control systems, expert systems, and the development of various mathematical models of pathological conditions (Ye. V. Gubler, 1978; A. L. Asachenkov and L. D. Belykh, 1978; V. P. Spichev and G. G. Gurkov, 1986; A. M.



Litvinov and Ye. V. Reshetnikov, 1989; V. P. Spichev, et al., 1989; T. Sekiya, et al., 1984; R. J. Anderson, et al., 1984).

Our experience in using CER even today permits us to solve the most difficult problems of the development, creation, and introduction of a unified automated control system, the basic purpose of which is to improve and optimize the prophylactic, therapeutic, and diagnostic work. This in turn is associated with the development of automated systems adapted to problems that are solved by the specific military therapeutic establishment and its respective subunits.

The widespread introduction of CER into the practice of therapeutic institutions on the basis of principles of a system approach makes it possible to manage the significant increase in the volume of information that enters daily; however, in this case there are new problems of an organizational, professional, and psychological nature. Among them are the systemic restructuring of the administrative infrastructure of the therapeutic establishment; the degree of preparedness of the medical staff for transition to new principles of organizing the therapeutic and diagnostic process; and the ability of each colleague to change his usual structure of activity and learn to work on the computer.

The basic reasons for the low level of performance of the automated control systems (ACS) in the therapeutic establishments were either the fragmentary nature of the introduction of CER without their structural integration into a unified system, or the attempt to solve global problems without previous preparation of the infrastructure for work in such conditions. The lack of sufficient Soviet experience, the acute deficit of CER, and extremely low program support and its isolated nature also complicate tasks of organization and development of ACS with the purpose of improving the preventive, therapeutic, and diagnostic work.

We will discuss some aspects of the organization and development of automated control systems based on the example of the therapeutic and diagnostic system. An analysis of the activity of the therapeutic establishments demonstrates that information that the specialists obtain when recording passport data, identifying the complaints of the patient, studying histories of life and disease, studying the data of objective examinations (laboratory diagnosis, instrument diagnosis, etc.), and in the observation of the course of the disease and dynamics of various indices during treatment underlie all of the decisions made and the respective actions taken that involve the diagnosis, prognosis, consultation, treatment, etc. Thus, a conceptual model of this system assumes treatment and unification of the above-mentioned currents of information with subsequent realization based on their purposeful functions in the therapeutic establishment (Fig. 1).

The purpose of developing the ACS is providing the medical personnel with the necessary information for well-founded decision-making, reducing the time for making the decision and using mathematical methods in the diagnosis, treatment, and prediction of illness outcomes. The basic functional groups of this system include: clinical and laboratory, functional, and special instrumental (endoscopic, X-ray,

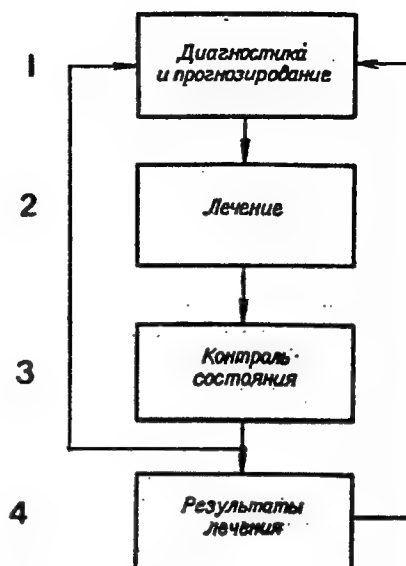


Figure 1. Conceptual model of system.

Key: 1. Diagnosis and forecast; 2. Treatment; 3. Monitoring of status; 4. Results of treatment.

radioisotopic, etc.) investigation subsystems and a subsystem for therapeutic wards (by profile with consideration of their specialization) and administrative subunits.

Combining the subsystems of the clinical laboratory, functional, and special instrumental investigations into a diagnostic center that has a unified material base makes it possible to significantly increase the quality and increase the volume of diagnostic procedures and expand the analytical aspects of investigations and their prognostic value in the interests of all of the therapeutic establishments in the region. It also makes it possible to develop formal documents for automated processing (case history, documentation for calculation and accounting data, clinical laboratory, function, and special instrumental investigations, etc.).

Providing the peripheral therapeutic establishments with computers creates the prerequisite for information exchange with diagnostic centers and therapeutic wards of central hospitals and receiving consulting help, information, statistical data, etc., by means of communication lines.

The development of automated control systems for the therapeutic and diagnostic process will provide for automated input of data into the system from the laboratory instruments and diagnostic equipment; processing and analysis of the data entered by means of selected algorithms; storage of information on patients (passport data, structure, results of investigations, treatment, etc.); retrieval of information by system users; documentation of necessary results of activity, recording of supplies, equipment, and other accounting data; and compilation of methodical material used in the form of programs for advanced professional training and offering various types of counseling guidance.

The subsystem of laboratory investigations is of special interest in the general structure of automated control systems. The introduction of computers into a complex multi-profile laboratory ward is a basic component in the development of the ACS. By interacting with all the therapeutic wards, it concentrates data from various fields. The success of treatment in many ways depends on the quality and volume of investigations performed and the operative nature of the work.

One of the first stages of developing ACS, considering the gradual nature of this process, is the creation of a subsystem of laboratory investigations (Fig. 2), the primary tasks of which are the automated input of data from laboratory equipment, devices, and analyzers into computers and the primary processing of information to obtain laboratory indicators and their documentation; systemizing the results of laboratory investigations and their statistical processing; the development of a data base of laboratory investigations; and training physicians and laboratory assistants in techniques of clinical and laboratory diagnosis using computers. Execution of these tasks will make it possible at the first stage to standardize the data coming from the laboratory instruments; unify the clinical and laboratory methods of investigation and increase their accuracy; reduce the time for obtaining results; increase the volume of investigations; increase the quality and improve the clarity of training material; and introduce accounting and other documentation.

At the second stage, the automated subsystem of laboratory investigations in combination with other diagnostic subsystems (functional and X-ray diagnosis) provides expert assessment and prognosis of the course of the disease, simulates pathological conditions, and selects the method and remedies for treatment.

The first step in performing the functional tasks with the laboratory investigation subsystem is automated input and processing of data that come from laboratory analyzers, devices, counters, and microscopes into computers that consist of transforming this information into indices for algorithms for processing.

The conversion algorithms are equations for calculating indices, for example, of tests of the first level for assessing the immune status, acid-base balance, etc. Statistical processing, one of the basic methods used for making a decision in conditions of uncertainty, searches for laws and probable characteristics necessary for creating the data base and expert system.

During such processing we define statistical assessments as well as the function of laboratory indices to the identifiers of an object, its status (well-being, age, diagnosis, etc.) and a number of other factors (heliobiological, seasonal, etc.). Moreover, statistical analysis makes it possible to find correlation coefficients for various indicators and factors, as well as between indicators and factors. This makes it possible to make the necessary number of diagnostic indicators and other factors more precise when conducting laboratory investigations for various diseases.

The expert system (ES) is a complex of programs used to analyze, study, classify, counsel, make conclusions, diagnose, predict, monitor, and teach. The use of logical constructions called rules is the basis of the experience and skills in the form of the expert system. Using lists compiled from such rules, the system can make conclusions based on logical conversions. The nucleus of any expert system is the data base and knowledge base.

The expert system must satisfy the following requirements: it must use the existing experience for solving problems; it must make effective decisions when information is incomplete; and it must form new skills. The ES in the automated system of laboratory diagnosis assesses the indicators and gives a prognosis of the course of the disease based on the mechanisms and probable characteristics identified during statistical processing depending on the identifiers of the status and the indicators. The system makes it possible to use the dialogue regime and formalized knowledge and algorithms for making decisions, and on this basis find solutions to problems.

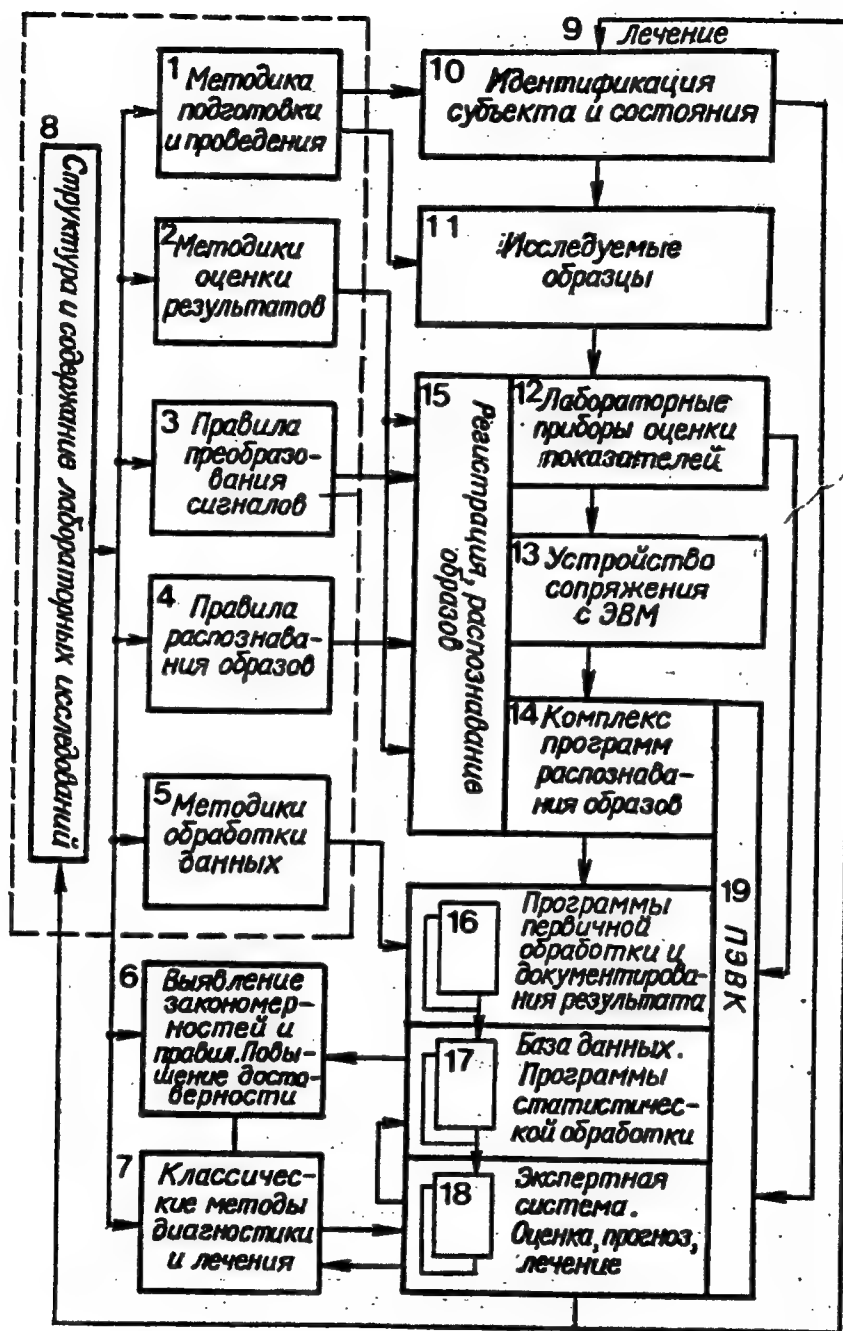
One of the chief methods of gathering new information in the expert systems is mathematical simulation, which is ideally conducted: when experiments with an actual subject and investigations of alternatives to its condition are impossible; when it is difficult to maintain identical conditions for each repetition of the experiment; when there is no final mathematical positioning of the task and developed analytical methods to solve it; or when obtaining statistically significant results requires a great deal of time and resources.

Mathematical simulation makes it possible to obtain quantitative functions of the parameters in question with selected factors. For example, under the influence of immunoregulators, the parameters in question may be indicators of the immune status and other objective data on the status of the patient or periods for recovery, and the factors affecting them, such as specific drugs, methods of their use, doses, aspects of the course of the disease, patient's age, etc. As a result of the research, a mathematical model of the parameter in question as a function of several factors is developed.

The mathematical function obtained makes it possible in the future to simulate the process of correcting the indicators of the patient's status to given values by changing the values of the factors. The indicators at which the subject's status normalizes will actually be the recommendations that must be observed in order to guarantee a positive outcome of treatment.

In conclusion we should note that no matter how technically advanced a given development of an automated control system appears, its assessment must be determined on a scientific level using the methods in it and by a thorough substantiation of the standard medical base used and the quality based on world standards. Only then will the development of a unified automated system provide substantial savings and help solve problems facing public health.





**Figure 2. Structure of laboratory investigation subsystem**

**Key:** 1. Method for preparation and performance; 2. Methods of assessing results; 3. Rules for converting signals; 4. Rules for recognizing patterns; 5. Data processing methods; 6. Identification of mechanisms and rules. Increasing reliability; 7. Classic methods of diagnosis and treatment; 8. Structure and content of laboratory investigations; 9. Treatment; 10. Identification of subject and status; 11. Patterns examined; 12. Laboratory instruments. Assessment of indicators; 13. Linking device with computer; 14. Complex of programs recognizing patterns; 15. Recording and recognizing patterns; 16. Programs of primary processing and documentations of result; 17. Data base. Statistical processing programs; 18. Expert system. Assessment, prognosis, treatment; 19. PEVK [as published].

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### Treatment of Victims Poisoned With Highly Toxic Substances

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[Article by N. V. Savateyev, Laureate of the USSR State Prize, Professor, and General Major of Medical Service, Retired; Yu. Yu. Bonitenko, Doctor of Medical Sciences and Colonel of Medical Service; and S. A. Kutsenko, Doctor of Medical Sciences and Lieutenant Colonel of Medical Service]

UDC 615.91:623.459]-08

[Text] Our proposal for the group classification of highly toxic substances (HTS) and description of the syndromes (disorders in the nervous and cardiovascular systems, external respiration, parenchymal organs, and gastrointestinal tract (N. V. Savateyev and S. A. Kutsenko, 1983; N. V. Savateyev et al., 1989)) most frequently encountered in their poisonings to a certain degree determine the strategy and tactics for rendering medical care at the site of the injury and further treatment of the victims.

Removal of the manifestations of intoxication and its related disturbances in homeostasis are conducted by means of regulation with agents and methods of etiotropic, pathogenetic, and symptomatic therapy in the toxicogenic as well as somatogenic stages of poisoning at various levels (Ye. A. Luzhnikov, 1982). With respect to current concepts, we may discuss the following basic directions for managing exotoxicoes: stopping the local effect of the poison and its further resorption, forced elimination of the absorbed poison from the body, using specific antidotes, maintaining the vital functions of the body and constancy of the internal environment, removing pathological alterations on the part of individual organs and systems, and preventing and treating complications.

When examining these principles with respect to HTS victims, it must be emphasized that the effectiveness of therapy will depend significantly on the prompt and correct rendering of emergency medical care at the site. Victims of HTS with pronounced irritating and burning (chlorine, ammonia, etc.) and neurotropic (organophosphoric compounds, etc.) properties will be in greatest need of this attention.

The measures aimed at stopping the local effect of the poison and its resorption by means of individual protection agents, transporting (carrying) the victims from the contaminated area, and sanitation treatment are among those of primary importance. It is particularly important to rapidly cleanse the skin and mucous membranes of the substances that burn the skin, which is achieved by prolonged (10-15 min) washing of the affected areas with water. Special neutralizing solutions do not generally have any advantage in this situation. The use of broad spectrum pathogenetic agents is indicated with sharp pain, acute respiratory or cardiovascular insufficiency, coma, psychomotor excitation, and convulsions that are frequently observed directly at the site of the injury.

The poison may be removed from the blood by stimulating the natural excretory processes (forced diuresis and hyperventilation) or creating artificial means of elimination based on principles of dialysis (hemodialysis using an artificial kidney and peritoneal dialysis), adsorption (hemo- and lymphosorption) or transfusion (blood transfusion or plasmapheresis).

Forced diuresis is most beneficial when the toxic agents or their active metabolites dissolve well in water and are eliminated from the body primarily in the urine (some alcohols, organophosphoric compounds, organic acids, etc.). Forced diuresis with "alkalization" is also very effective for preventing acute renal insufficiency in hemolytic toxin poisonings (Ye. A. Luzhnikov, 1982).

Since many HTS, especially volatile lipotropic substances, are eliminated from the body with exhaled air, hyperventilation in these poisonings is theoretically substantiated. The higher the elimination capacity of hyperventilation, the lower the coefficient for solubility of the substances in the blood and the lower their concentration in the blood-alveolar air system. Hyperventilation is achieved by means of inhaling a mixture of oxygen and CO<sub>2</sub> (carbogen) with

spontaneous respiration or with artificial respiration of the lungs (ARL). There is little clinical experience in using this method and it involves mainly intoxication with aliphatic halogenated hydrocarbons, carbon monoxide, and carbon disulfide (B. D. Komarov, et al., 1981; U. Kindler, et al., 1977). Its use in HTS poisonings is promising.

Among the "artificial" methods of detoxication, hemodialysis using "artificial" kidney devices (HD), hemosorption (HS), and blood transfusions (BT) are the most interesting. The dialysis methods, especially HD, are very effective with many toxic substances (alcohols, hydrazines, some organophosphoric compounds, heavy metal compounds, etc.). The therapeutic effect of HD in exogenous intoxications from poisons that can be removed by dialysis has been confirmed by many years of practice (I. I. Deryabin and M. N. Lizanets, 1973; Ye. A. Luzhnikov, et al., 1977; S. N. Golikov, 1977; B. D. Komarov, et al., 1981). However, the complexity of the apparatus and laboratory monitoring diminishes the possibility of clinical use of dialysis, especially with large-scale disasters. Another negative aspect is that fat-soluble poisons and substances conjugated with proteins are poorly eliminated by dialysis of the blood.

These disadvantages have been largely eliminated in hemosorption, which in its detoxication capacity is as good as HD, and in a number of cases is substantially better. The great therapeutic effectiveness of HS has been noted in

poisonings with organophosphoric compounds, halogenated and aromatic hydrocarbons, some alcohols, organoelemental compounds, etc. (B. D. Komarov, et al., 1981; V. G. Nikolayev, 1984; V. K. Bondar, et al., 1986). Hemosorption can be performed with a relatively simple device and trained medical personnel not only in infirmaries, but also at the pre-hospital stage (B. D. Komarov, et al., 1981), which makes it possible to consider this method one of the most promising for widespread clinical application.

The use of blood transfusions is generally limited to cases of serious poisonings with toxins that are hemolytic or that inactivate the hemoglobin (hydrogen arsenide, aniline, nitrobenzene, etc.); hyperbaric oxygenation (HBO) treatment is preferred in carbon monoxide poisonings. Blood transfusions are also used when prompt performance of HD or HS is impossible, or in conjunction with dialysis methods (B. D. Komarov, et al., 1981).

Undoubtedly, the use of specific antidotes, particularly in the early stages of poisoning, substantially improves the outcome of subsequent treatment. However, the arsenal of such agents is currently quite limited (see Table). In these conditions, pathogenetic and symptomatic therapy directed at compensating the basic clinical manifestations of intoxication and maintaining the functions of the vital organs and constancy of the internal environment become particularly important.

**Antidote Therapy for Highly Toxic Substance Poisonings**

Toxic substance	Antidote	Basic mechanisms by which antidotes act	Instructions for antidote therapy
1	2	3	4
Halogenated hydrocarbons (tetrachloromethane, methyl bromide, etc.)	Acetylcysteine	Binds active metabolites, elevates level of endogenous glutathione	10% solution in 5% glucose intravenously (up to 250-300 mg/kg body weight per day) for 1-2 days
Hydrazine and its derivatives	Vitamin B <sub>6</sub> (pyridoxine hydrochloride)	Restores pyridoxal enzyme activity	5-10 ml of 5% solution two to three times per day intravenously or intramuscularly. For serious cases use 25 mg/kg body weight (1/4 dose intravenously and 3/4 dose intramuscularly). For lingering convulsions repeat every 2-3 hours.
Methemoglobin formers (aniline, nitrobenzene, etc.)	Ascorbic acid	Converts methemoglobin into hemoglobin	10-20 ml of 5% solution intravenously repeatedly (up to 60 ml per day)
	Methylene blue	Same	1% solution of 5-10 ml intravenously. In serious cases injections are repeated every 3-4 hours.
	Cystamine dihydrochloride	Prevents formation of methemoglobin and erythrocyte hemolysis	0.4 g injection two to three times at 2-3 hour intervals.
Hydrogen arsenide	Mecapride	Oxidizes hydrogen arsenide with the formation of non-toxic cyclic thioarsenites	1 ml of 40% emulsion intravenously. In serious poisonings, use two to three injections of 2 ml each every 4-6 hours for the first day. For the next 2-3 days use two injections every 8-12 hours.
Carbon monoxide	Oxygen	Eliminates hemic hypoxia and accelerates dissociation of carboxyhemoglobin	At first have patient inhale 80-100% oxygen, and then 40-60% oxygen. The most effective hyperbaric oxygenation is in sessions lasting 60 to 90 min with an excess pressure of 1.5-2 atm.
Compounds of arsenic and heavy metals (mercury, bismuth, etc.)	Unithiol	Binds toxins and reduces activity of "thiol" enzymes	5-10 ml intravenously or intramuscularly four times per day for the first day, then decrease to one injection per day

**Antidote Therapy for Highly Toxic Substance Poisonings (Continued)**

Toxic substance	Antidote	Basic mechanisms by which antidotes act	Instructions for antidote therapy
1	2	3	4
	Tetacin calcium	Binds toxins and forms complex compounds that are excreted in the urine	20 ml of 10% solution in 250-300 ml of 5% glucose one to two times per day intravenously (no more than 3 hour interval) for 3-4 days
Alcohols: allyl, chloro-, and fluoroethyl	Ethyl alcohol	Reduces cleavage of alcohols to active metabolites by competing for alcohol dehydrogenase	Inject 1.5-2 g/kg body weight per day in a 30% solution or intravenously in a 5-10% solution in 5% glucose with uniform distribution of the daily dose to maintain a blood ethanol concentration of at least 1 g/liter. Treatment takes approximately 1 day.
Organophosphoric insecticides, carbamates	Atropine sulfate	M-cholinolytic effect	Use one to three ml of a 0.1% solution intramuscularly injected every 20-30 min (in serious cases use 5-7 ml intravenously every 10-15 min) until signs of light reatropinization appear. Maintain atropinization for 2-7 days.
	Dipiroxime	Reactivates cholinesterases, binds toxin, and reduces sensitivity of cholinoreceptors	Use 1-2 ml of a 15% solution two to four times per day intravenously for 2 days
	Isonitrosine	Same	Use 3 ml of a 40% solution intravenously or intramuscularly repeatedly (maximum daily dose of 8-10 ml)
Cyanides (cyanic acid, cyanogen chloride, nitriles, etc.)	Anticyan [sic]	Forms methemoglobin, which binds the cyanides	Intramuscularly 1 ml or intravenously 0.75 ml of a 20% solution in 10-20 ml of a 40% solution of glucose. In serious cases use 1 ml intramuscularly every 30 or 60 min after first injection
	Amyl nitrite	Same	Inhale vapors from crushed ampul
	Methylene blue or chromosome	Forms methemoglobin and binds excess protons	Use 1-2 ml/kg body weight of 1% solution intravenously
	Sodium thiosulfate	Forms non-toxic thiocyanates	Intravenously slowly administer 50 ml of a warmed 30% solution
	Glucose	Forms non-toxic cyanohydrins	Use 20-40 ml of a 40% solution intravenously

In the syndromological description of HTS poisonings, we first calculate the most likely development of inhalational and percutaneous (inhalational-percutaneous) injuries at the site of the accident. At the same time we cannot completely exclude the enteral means of entry of these toxins into the body (due to contamination of water or foodstuffs), which is also taken into account when isolating the leading clinical poisoning syndromes.

Impairments to central nervous system function, which is most often expressed as disorders in consciousness (drowsiness, sopor, coma, or acute psychosis), generalized convulsions and hyperthermia that develop as a result of the neurotropic effect of poisons, hypoxia, alterations in cerebral hemodynamics, and brain edema are among the most common syndromes. Pathogenetic and symptomatic therapy measures for these impairments include: preventing mechanical trauma (with convulsions or psychomotor excitation), prevention and elimination of ODN [as published] of central and aspirational genesis, oxygen therapy, administration of preparations that improve cerebral metabolism and the status of cerebral hemodynamics (vitamins, piracetam, nootropil, euphyllin, trental, cavinton, etc.). In order to eliminate brain edema, the victim's body should ideally be elevated and an ice pack placed on the head. He should internally be administered glycerin and parenterally given diuretics and glucocorticoids. A lumbar puncture and ARL and hyperventilation should be performed when indicated. For convulsions and psychomotor excitation, phenazepam

(seduxen), sodium hydroxybutyrate, barbiturates, etc., should be prescribed. Measures to cool the body are used and neuroleptics (aminazin, droperidol), analgesics (amidopyrine, analgin), and antihistamines are prescribed to reduce high hyperthermia of central origin. It is recommended to restore the water balance in cases of dehydration. The administration of large ("stimulating") doses of analeptics upon development of a deep coma is contraindicated.

Impairments to external respiration function (ventilation disorders) as a result of HTS poisoning may be expressed in the irritation of respiratory tracts, aspirational obstruction (mechanical asphyxiation, generalized bronchial spasms) and/or restrictive syndromes. Sometimes these impairments can stem from depression of the respiratory center or an impairment in the function of the respiratory musculature (in convulsions or neuromuscular block). For irritations of the upper respiratory tracts, inhalation of a mixture to compensate smoke inhalation, beclomet, alkaline inhalants, the use of codeine, euphyllin, antihistamines, analgesics (analgin, promedol), and the use of neuroleptic analgesia are indicated. ARL should be performed immediately in cases of reflex apnea.

In cases of aspirational obstruction ventilation impairments the following are needed: clearing and keeping the upper respiratory tracts open (mechanical clearing of the oral and oropharyngeal cavities, insertion of an airflue, and intubation or a tracheostomy), washing the bronchi, inhalations of

humidified oxygen and substances that expand the bronchi (euphyllin, isadrine, salbutamol, etc.), and parenteral administration of atropine, euphyllin, glucocorticoids, and antibiotics. In order to prevent the development of Mendelson's syndrome, as well as to prevent the aspiration of gastric contents, the latter are removed with a probe. Then antacids (almagel, magnesia, etc.) are injected into the stomach.

The restrictive syndrome in HTS victims stems chiefly from toxic edema of the lungs. Medical care measures in this instance include: placing the victim in a semi-sitting position, dressing the oropharynx, inhaling oxygen passed through ethyl alcohol, administering glucocorticoids (becotide, beclomet), and parenteral administration of fast-acting diuretics (lasix, urea), glucocorticoids, ascorbic acid, antihistamines, cardiac glycosides, and heparin. With the development of edema of the lungs and elevated arterial pressure, ganglioblockers, alpha-adrenoblockers, and blood-letting are employed, while sodium hydroxybutyrate is used with excitation. If edema of the lungs is not arrested by these means, ARL is performed with volume respirators with an excess pressure at the end of exhalation. A "water stress" and the administration of adrenalin are contraindicated.

Impairments to cardiovascular system function in HTS injuries may be expressed primarily by hypertension (generally transitory), signs of acute cardiovascular (basically vascular - collapse, exotoxic shock) insufficiency, and myocardial dystrophy. Arterial hypertension is eliminated by the use of hypotensive and diuretic agents. With the development of acute cardiovascular insufficiency, cardiac glycosides, diuretics, and plasma substitutes (rheopolyglucin, etc.), glucosolaline solutions, glucocorticoids, proteolysis inhibitors (contrical, pantrylin, etc.), heparin, antiaggregants (trental, curantyl, etc.), and peripheral vasodilators are used. When relative hypovolemia due to vasodilation in the onset of vascular insufficiency prevails, vasopressors (mesatone, noradrenalin, dopamine) are used.

Serious poisonings with various chemical agents are frequently accompanied by the development of myocardial dystrophy. In this instance, the prompt correction of disturbances in homeostasis and the use of vitamins, ATP, riboxin, anabolic steroids, potassium preparations, and antiarrhythmia agents (beta-adrenoblockers, calcium antagonists, etc.) are important. Cardiac glycosides and electrical shock therapy are used when indicated.

In poisonings with some HTS, injury to the parenchymal organs, the liver and kidneys (toxic hepatonephropathy), is possible with the development of serious cases of acute hepatic, renal, or hepatorenal insufficiency. Disturbances in homeostasis underlie these injuries, along with the direct hepato- or nephrotropic effect of the poisons.

In order to prevent and treat toxic hepatopathy, a carbohydrate diet (parenteral feeding) is prescribed, and the status of the internal environment of the body is corrected. With moderately expressed forms, the infusion of glucose with insulin, essentielle, and vitamins (C, E, K, B group, etc.), lipoic acid, cholinchloride [sic], proteolysis inhibitors and glucocorticoids (in the early stage) are indicated. In serious

forms the following are recommended: administration of drugs into a bougieuraged umbilical vein, cleansing of the intestines, use of blood transfusions, hemosorption (lymphosorption), plasmapheresis, and hyperbaric oxygenation; contraindicated are barbiturates, opium preparations, methionine, and hepatotoxic antibiotics.

Antishock measures and correction of homeostatic disturbances are performed in the early stage of toxic nephropathy. A glucose-novocain mixture, vitamins, vasodilators (papaverine, euphyllin, droperidol), diuretics (lasix, uretine), heparin, antiaggregants, and proteolysis inhibitors are administered. A diet (parenteral feeding) with limited protein and potassium intake, strict water regimen, vitamins, anabolic agents, proteolysis inhibitors, heparin, vasodilators and hypotension agents, and calcium chloride are prescribed in the oligoanuric stage. Also indicated are intestinal cleansing, enterosorption, hemodialysis, hemosorption, and plasmapheresis. A diet with high protein, carbohydrate, and potassium content, free water regimen, anabolic and symptomatic agents, and vitamins is outlined for the polyuric phase.

The development of gastrointestinal disturbances due to functional disorders in stomach and intestine activity, as well as inflammatory processes (acute gastritis, enteritis, colitis) is also possible in HTS poisonings. In order to prevent and treat these disturbances, fasting for 24 hours, a bland diet (parenteral feeding), and spasmolytic agents (atropine, platyphylline, no-shpa, etc.), antihistamines, antibiotics, and enzyme preparations, analgesics, antacids, vitamins, and astringents are recommended.

In addition to the above-listed syndromes, serious disturbances in the water-electrolyte balance, acid-base balance, hemocoagulation (DVS [as published, possibly temporomandibular joint pain dysfunction-syndrome]-syndrome type), the correction of which occurs in respect with general principles of intensive therapy are observed in serious forms of HTS injuries.

In this report we provided merely a general description of the current status of the problem of treating poisonings with highly toxic substances. The particular aspects of this problem, as well as principles of organizing the medical care for the victims of HTS will be reviewed in subsequent publications.

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### Biological Dosimetry in Combined Radiation Injuries

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[Article by V. G. Vladimirov, Professor and General Lieutenant of Medical Service, and V. M. Teslenko, Candidate of Medical Sciences and Colonel of Medical Service]

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[Text] The early diagnosis and triage of victims of nuclear weapons is extremely important in view of the fact that masses of victims may arrive simultaneously at the stages of medical evacuation in this situation. The diagnosis of combined radiation injuries (CRI) is particularly difficult, since the radiation component is "masked" by symptoms of trauma or burns. The number of such victims in the general structure of casualties may reach 50 percent or more.

In order to identify those individuals that have been exposed to radiation in conditions of a modern war, personal and collective dosimeters will be used. However, the information that can be obtained using physical instruments will not be adequate for successful triage. There are a number of circumstances that diminish the value of data from physical dosimetry. In the first place, we cannot prevent situations where dosimeters for some reason or other will be lacking. In the second place, individual fluctuation in the radiosensitivity of some people and the possibility of uneven exposure of them due to shielding of various parts of the body by protective structures of combat equipment will decrease the prognostic value of dosimeter readings. In connection with this, a great deal of attention has been paid in recent years to the development of special biological methods with which the degree of radiation injury using post-radiation shifts in the body can be established in the early periods. These methods combined with instruments to support their operation in field conditions form the concept of biological dosimetry. Biodosimetry in CRI is a component of the general problem of biodosimetry of radiation injury, since its purpose and tasks in both cases are the same. It is the retrospective determination of the radiation dose to which the victim was exposed, and prognosis of the likely severity of the radiation injury.

Twelve years have passed from the time that the first review of data on biodosimetry in radiation injuries was published

(V. G. Vladimirov and A. D. Smirnov, 1978). Some progress has been made in this problem since then, although we must acknowledge that significant advances have still not been made.

The development of biodosimetry methods involves great difficulties, since the interests of the military medical service are making a number of rather rigid demands on them. The chief of these are: obtaining a great deal of information using this method, which must be accomplished within 6-24 h after exposure to various types of ionizing radiation; the ability to differentiate between doses of 2 and 4 Gy, which would separate the groups of victims with slight and serious degrees of acute radiation sickness; the ability of technical implementation of the method, that is development of the respective instrument, preferably one that operates automatically; and finally, specificity of the method, that is, the ability to differentially diagnose radiation injury.

The latter is particularly important for combined radiation injuries. However, in actually assessing the current situation, we can hardly rely on the development of tests that are perfectly specific for radiation pathology. At this stage, the current laboratory indicators may be divided into only relatively specific indicators, those which are closely tied to pathological mechanisms of radiation trauma and actively react to radiation exposure (for example, alterations in chromosomal aberrations, the degree of lymphopenia, an elevation in the level at which products of the post-radiation decay of DNA are excreted, and a number of others), and inspecific indicators, the change in which is uniformly typical for radiation as well as non-radiation traumas (for example, indicators that characterize impairment in the structure of the cell membrane, and a number of metabolic tests), but which nevertheless have a reliable correlation with the radiation dose.

We currently use a classification of laboratory diagnostic tests (or, as they are also called, biological indicators) for radiation exposure that is based on the methodology and nature of the subject of the investigation. Based on this principle, biophysical, biochemical, immunological, cytogenetic, and hematomorphological indicators are identified. In the Soviet Union, such classification, which has undoubted advantages from a practical point of view, was first proposed by V. G. Vladimirov, and then further elaborated by K. P. Khanson, V. Ye. Komarov, and V. K. Mazurik (1987). This same ideology was discussed in a recently published collection of works from the International Symposium on Biodosimetry (1988). In solving problems of developing biodosimeters, the most promising developments are those of methods based on the basic phenomena of radiation pathology, such as the occurrence of structural impairments in the DNA and other macromolecules, damage to chromosomes and cell membranes, and post-radiation devastation of the bone marrow and lymphoid organs, as well as a change in the number of some metabolites in the radiated organism.

With respect to the foregoing, we will examine the most important indicators of radiation injury from the point of view of practical use. Methods of recording the radiation-induced radicals, the effects of chemiluminescence and



ultraviolet fluorescence of cells, nuclear magnetic resonance, and thermography are in the first group of tests which are based on the biophysical principles of cell and subcellular structure analysis. The informativeness of this group of tests in CRI has not been investigated, although it is clear that some of them are worthy of attention. Indicators based on assessment of the structural impairments of cell membranes are of the greatest interest. Indicators characterizing the electrophoretic mobility of cells, binding of lectins with erythrocyte and leukocyte membranes, the sedimentation process of erythrocytes in a density gradient, and an elevation in the number of "adhesive" leukocytes are used for this purpose.

All of these indicators have an extremely relative specificity with respect to radiation exposure, while some of them in CRI even lose their informativeness. Included in the latter is the method of calculating the number of "adhesive" leukocytes which agglutinate to cotton-viscose wadding when passed through it. In radiation injuries, this method in conjunction with the burn cannot diagnose the radiation component, although in exposure combined with mechanical injury it "operates" quite satisfactorily. The method is simple to use and therefore is completely deserving of attention, in spite of its shortcoming.

Evidently, impairment of the lipoprotein structure of the cell membrane as a result of excess hydroperoxides formed in response to radiation exposure should be considered one of the important pathogenetic mechanisms of the development of radiation injury. Hydroperoxides, which are radiotoxins, can penetrate the cell and inhibit processes of post-radiation DNA repair. The formation of lipid peroxides is stimulated by enzymatic reactions of oxidizing the lipids, primarily due to the enhanced activity of oxidase and hydrogenase. Experiments on erythrocytes obtained from dogs following their exposure to a 3 Gy dose LD<sub>90/30</sub> demonstrated that their incubation in a culture containing a hydrogen peroxide solution results in an increase in the number of destroyed cells (A. A. Yarin, 1976). Our experiments, which were conducted 1-3 h after radiation exposure, showed that the number of hemolyzed erythrocytes increased by 50-60 percent. These data suggest that this indicator also may be used in the diagnosis of CRI.

Among the biochemical indicators, we are trying to use the change in the total content and quantity of adenine-thymine DNA base pairs that are isolated from peripheral blood cells, the number of breaks in the DNA strands, and the impairment of their suprahelical structure. Due to the rapidity and rather effective post-radiation repair of DNA (and for this reason the inadequacy of information provided), we could not use the calculation of the frequency of primary breaks in the strands and the degree of impairment of the suprahelical structure of the DNA. Some information on the severity of radiation injury in the early period, including in cases of CRI, can be obtained by calculating the content of adenine-thymine base pairs in leukocyte DNA by means of fluorescent probing. However, the method is complex and we can hardly rely on it at present.

A. S. Belokhvostov (1987) recently established that the content of extrachromosomal DNA in the blood plasma increases following radiation exposure. Moreover, these changes occur within certain parameters and are dose-dependent. Whereas in a sublethal exposure, the increase in the DNA level in rat blood plasma is still insignificant and not always statistically reliable (an average of 35 ng/ml with a normal content of 10-30 ng/ml), with an increase in the exposure dose to lethal (8 Gy), the DNA content doubles (reaching an average of 70 ng/ml). In cases of supralethal exposure (100 Gy), the DNA content in the blood plasma exceeds the norm by more than 10-fold (400 ng/ml).

These data attest to the potential for using the rise in the DNA blood plasma content to determine the radiation exposure dose, and consequently, we regard this criterion as a potential biodosimeter. In published literature there is information showing that similar changes in the amount of DNA are observed in the blood plasma and in combined radiation-mechanical injuries. However, this indicator is universal to some measure and the question of whether it can be used in man as a diagnostic test for large-scale admittance of victims remains unclear. Additional work is needed in order to reach a final conclusion.

The indicators that reflect the accumulation of polydeoxyribonucleotides in cells and the increase in the thymidine concentration in blood serum are considered informative for diagnosing the degree of exposure in CRI. Unfortunately, these methodical approaches are very complex and therefore do not hold any certain promise.

The groups of indicators that register impairments in metabolic processes in the exposed organism are also of certain interest in CRI. However, since the mechanical and particularly the burn trauma itself can cause substantial changes in many facets of metabolism, the role of these tests becomes very insignificant, and we will not dwell on them in detail in this report. We will only say that of these biochemical indicators, only a limited number of them hold promise for being used for the diagnosis of radiation injury and prognosis of the degree of severity of acute radiation sickness. However, work in this direction is being conducted, and we currently have some interesting data.

In particular, the processes of proteolysis in the body in individual as well as combined radiation injuries have been studied at the Central Scientific Research Institute of the USSR Ministry of Health in recent years. The total pool as well as the concentration of individual amino acids and the inhibitory capacity of the blood have been investigated. As a result, we found that the activity level of endogenous protease inhibitors in the blood reflect the status of proteolysis in the body as a whole. Since activation of proteolysis is typical for the early period of CRI, these approaches may have certain scientific interest for diagnostic purposes. These experimental data suggest that the complex assessment of the status of proteolysis in a number of cases may be used for determining the severity of CRI.

The next group of indicators that must be in the specialists' field of vision is composed of methods based on the analysis of radiation injuries to the chromosome structure. An

estimate of the number of chromosomal aberrations, especially with a count of their type, has long been considered the best biodosimeter. Unfortunately, the method is very laborious and requires highly skilled personnel. In the USA an instrument has been developed that will estimate and analyze the chromosome damages automatically. If such a solution of the problem also fulfills other demands of military medicine, then we will be returning to the method of recording chromosomal aberrations in the near future.

An indicator that characterizes the number of "micronuclei" in the lymphocytes of peripheral blood may also be promising. But experimental data that would prove its usefulness in CRI have not yet been obtained.

We know that indicators based on the effect of post-radiation death of radiosensitive cells, in particular the white cells of the peripheral blood, are widely used in radiology for the early diagnosis of acute radiation sickness. Even today they are the main guides for assessing the severity and giving a prognosis of the outcomes of acute radiation injuries. However, research conducted in the laboratories of V. G. Vladimirov and V. Ye. Komar aimed at investigating the dynamics of the number of lymphocytes in the blood following combined radiation-thermal injury in conditions of uniform as well as uneven exposure demonstrated that with these types of injuries leukocytosis rather than leukopenia generally develops in the first days. The degree to which it is expressed depends on the severity of the burn. It is five days before leukocytosis is replaced with extensive post-radiation leukopenia. Similar "extinction" of post-radiation leukopenia is observed in complex and compound injuries that include the mechanical component in addition to radiation, which makes assessment of the severity of the radiation injury impossible.

Thus, the calculation of the number of lymphocytes in the blood in CRI must be weighed carefully, and in each case the results of this analysis should be viewed critically and supplemented with data from other studies.

A complex indicator developed at the Armenian Medical Radiology Scientific Research Institute and based on assessment of the ratios of blood lymphocytes that differ in dimension and density and geometric parameters is closely involved with lymphopenia in its pathogenetic mechanisms. The authors obtained data that, in their opinion, are quite informative for identifying the radiation component in CRI in the early period. However, these data need reproduction and strict experimental checking. For fairness' sake, it should be said that a diagnostic test that is similar in its methodical principles and foundations was developed more than 10 years ago by Ye. V. Gembitskiy and Yu. F. Koval. These authors suggested that the number of lymphocytes in the peripheral blood could be estimated differentially by using the dimensions of the cells, after demonstrating that the ratio of three types of lymphocytes that differ in size changes regularly in proportion to the amount of radiation exposure. The respective experimental model of an instrument that automatically counts the cells was developed.

In recent years general attention has been given to the reticulocytes in the peripheral blood, the number of which, as was experimentally established in several species of animals (including dogs), changes with some dependence on the radiation dose in a period of eight to 24 hours after exposure. A 20-40 percent drop in their number indicates a light degree of injury, whereas a 60 percent drop indicates an average degree of injury, and a 70-90 percent drop indicates the development of a severe form of acute radiation sickness.

A report recently appeared in the press stating that specialists at the Lawrence Livermore National Laboratory had developed a very sensitive biodosimetric method. The object of investigation was erythrocytes in whose membrane one of the proteins normally is found in two varieties. It was found that ionizing radiation damages one of the genes responsible for synthesizing the respective protein. As a result, the cells formed after radiation exposure have only one form of the protein. Using the newest physical and biological techniques, monoclonal antibodies, laser fluorescence, piezoelectrical sorting of cells, and computerized spectrographs, the American scientists developed a fully automated device that makes it possible to very rapidly (up to 1,000 per second) count the cells that have the indicated protein in only one form. The defective cells are evidently maintained throughout life. At the very least the analysis of blood from victims of the atomic bombs at Hiroshima and Nagasaki confirm this effect, even after 40+ years.

With respect to the immunological indicators, we do not currently have an adequately clear concept of their diagnostic value, but they must be kept in mind as having potential.

Thus, in conclusion we should state that a significant number of methods have been developed that may be regarded as promising for solving diagnostic problems of a radiation pathology. The amount of information which they provide, the complexity, and the degree of development are by no means equal. For this reason we felt it important to identify two groups of methods. The first includes methods based on given approaches to recording genetic alteration or their sequelae. They are characterized by the large amount of information that they provide, but at the same time they are extremely laborious and require complicated, expensive equipment. The second group includes tests that were shown in experiments on various species of animals to yield quite acceptable diagnostic information that offers a correct assessment in 60-70 percent of cases of the severity of injury in a range of exposure doses that cause the bone marrow form of acute radiation sickness. They are relatively simple in a methodical sense. Primarily, they involve the calculation of the number of reticulocytes in the peripheral blood and the method of leukocyte adhesion, as well as some methods based on recording changes in the biophysical properties of the cell membranes.

It is possible that some of the indicated methodical approaches will need to be combined in order to increase the amount of information obtained. In addition, the approaches must be improved so that they can be used in

cases of mass radiation contamination in the first place, and secondly so that they can be performed by middle medical personnel.

The latter group of methods seem the most promising to us for further development. Some decrease in the informativeness due to maximum simplification of the technique and construction of the instrument is fully justified, while on the other hand, substantial complication and greater expense of the apparatus will not be in the interests of the military medical service that is preparing to work in conditions of large scale admittance of victims. This point of view is also supported by the fact that in actual conditions, biodosimetry methods are generally used in combination with physical dosimetry and clinical diagnosis, rather than alone. Clinical diagnosis remains the basis for diagnosis and triage of radiation victims. However, this in no way removes the problem of development of complicated methods and instruments designed to work in hospitals and at rear services establishments from the agenda. © COPYRIGHT "VOYENNO-MEDITSINSKIY ZHURNAL", 1990

#### Specifics of Medical Support for Parachute Jumps

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[Text] When making parachute jumps a person undergoes various stresses. Since these are extreme stress factors, they cause parachutists, especially beginners, significant nervous stress before as well as during the jump that gradually increases from the moment the parachutists receive the orders to jump. The stress peaks just before jumping from the plane. Even the night before the forthcoming jumps, an elevation in the level of autonomic functions is noted: more frequent respiration, more rapid pulse, rise in arterial pressure, increased perspiration, and enhancement of tendinous and periosteal reflexes.

Stress reactions with marked autonomic manifestations are possible when the parachutist does not thoroughly know all of the details of the forthcoming parachute jump and is not familiar with the parachute equipment and the unfavorable situations that occur when parachuting. In this situation there is a peculiar hypercompensation of the physiological functions of the body that surpasses the necessary level for neutralization of unfavorable factors, which may result in the development of neurotic reactions, especially in those with poorly developed emotional and volitional qualities. These shifts are found in experienced parachutists when the jump conditions change or when they are using new types of parachutes or other equipment, especially in unfavorable conditions.

When parachute jumping, the period of the free fall lasts from the time the parachutist jumps from the plane until the

canopy of the stabilizing (in jumps with stabilization) or the main parachute opens and fills with air. When the canopy of the main parachute opens, the speed of the free fall drops dramatically, and the parachutist experiences a certain stress with the sensation of impact. If the parachute harness has been well adjusted, the stress passes without any unfavorable sensations or consequences. The main cause of injury in the air is dynamic impact when the parachute opens, especially with a premature opening, when the parachutist has not even fallen away from the jet of the powerful air current created by the turboprop engines of the airplane.

The effect of impact stresses when making a jump in unfavorable conditions or when rules for jumping have been violated results in various injuries, most often to the lower extremities, and more rarely to the head and vertebrae. Non-penetrating traumas to the brain are chiefly cerebral concussion, which is accompanied by an impairment in consciousness from short-term disorientation to complete short-term unconsciousness with subsequent nausea, and sometimes vomiting, headache, autonomic impairments, and microsymptoms of pyramidal insufficiency.

Injuries to the vertebrae include injuries intervertebral disks and compression fractures of the vertebrae most often localized in the lower thoracic section. The neurological disorders that occur in this instance are characterized by pain (especially when moving or inhaling, or with axial stress to the spine or when palpating the bony process of the injured vertebra) that is caused by edema and compression of the roots. Spinal problems associated with injury to the spinal cord are also possible. These include: impairments in movement, areflexia, anesthesia below the level of injury, and disorder in pelvic organ function. Parachutists that have made many jumps and that have experienced many impact stresses when the canopy opens as well as when landing may develop degenerative-dystrophy alterations in the vertebra with reflector muscle blocks that cause disk and root syndromes.

Prophylactic measures aimed at preventing neurological disorders and at offering emergency medical assistance are very important in the support of parachute jumps. Prophylactic measures include thorough explanation to the physician of the mechanisms of impairments in nervous system activity in response to parachute jumps, and psychohygienic and psychoprophylactic measures. Training in special teams where all the elements of the jump are worked through play an important role. Correctly organized and methodically well-conducted lessons and training in parachute towns support the development of skills and techniques for safe jumping with the parachute and help solidify the emotional and volitional qualities.

The unit physician must be present when these exercises are being held in order to monitor the functional status of the parachutists' bodies, assess how well their physiological systems are trained, and offer methodical assistance to the exercise director. The physician must have everything necessary for offering assistance at the site of primary medical care in accidents. The doctor's bag should contain: anesthetics (2 percent solution of promedol, five

ampules; 0.5 percent solution of novocain, 450 ml), cardiac agents (2 ml Cordiamin, 10 ampules), iodine solution (20 ampules), 10 percent solution of ammonium hydroxide (10 ampules), 10 individual dressing packets, 10 bandages, two bracket joints, two rubber tourniquet bands, white plaster (one package), wire scalariform splints (10 sets, for upper and lower limbs), medical instruments (scissors, scalpel, tweezers, packaged syringes, tongue depressor, mouth dilator, airflue, tracheostomy tube, etc.), and gauze (400 g).

The army physician must be able to render emergency assistance in cases of non-penetrating injuries to the brain and spinal cord that occur in parachute jumps and at the landing pad. When necessary, resources at hand are used to immobilize injured body parts and transport the victims in ambulances to the detached medical battalion, neurological ward of the hospital, or the nearest civilian therapeutic establishment. © COPYRIGHT "VOYENNO-MEDITSINSKIY ZHURNAL", 1990

**Belorussian Program for Prophylaxis of Genetic Sequelae of Chernobyl**

917C0351A Minsk SOVETSKAYA BELORUSSIYA

in Russian 21 Feb 91 p 3

[Text]

Belorussian Program for Prophylaxis of Genetic Sequelae of Chernobyl			
No.	Measure	Executor	Timeframe Th;1;41. Scientific Provision for Prophylaxis of Genetic Sequelae of Chernobyl
1.1.	Perfect and put into operation a system of genetic monitoring for congenital developmental defects (CDD) and inherited diseases (ID) in all maternity hospitals in Belorussia	Inherited and Congenital Diseases Scientific Research Institute, Belorussian SSR (BSSR) Ministry of Health (ICDSRI)	1991-1993
1.2.	Develop novel methods of prenatal diagnosis of CDDs and IDs and search for markers signalling disturbances in fetal development	ICDSRI	1991-1995
1.3.	Develop methods for quantitative assessment of the mutation incidence due to chronic exposure to low doses of gamma radiation from different factors	ICDSRI; Genetics and Cytology Institute (GCI), BSSR Academy of Sciences	1991-1995
1.4.	Develop and apply effective methods of restoring the genetic homeostasis that has been upset in individuals exposed to radiation	GCI	1991-1995
1.5.	Investigate the social and socio-psychological aspects of the public's attitude towards the changing genetic situation in Belorussia	Sociology Institute, BSSR Academy of Sciences	1991-1993
1.6.	Develop a program for the medical and genetic prophylaxis of oncological diseases	GCI; Belorussian Oncology Scientific Research Institute	1991-1995
2. Measures for the Prophylaxis of Congenital Developmental Defects and Inherited Diseases			
2.1.	Widely publicize the advisability of bearing children between 20 and 35 years of age	BSSR Ministry of Health; BSSR State Publishing Committee; BSSR State Television and Radio	
2.2.	Introduce a section on "Inherited Human Diseases and Their Prophylaxis" that lasts at least 6 hours per year into the public school biology programs	BSSR Ministry of Information	1991
2.3.	Publicize the need for premarital genetic counseling for potential spouses coming from families with inherited diseases, as well as for potential spouses that are blood relatives	BSSR Ministry of Health; BSSR State Television and Radio; BSSR State Publishing Committee	continuously
2.4.	Conduct retrospective genetic counseling with all families at risk	BSSR Ministry of Health	continuously
2.5.	Provide a specific vitamin program for all women planning to become pregnant	BSSR Ministry of Health	1991-1995
2.6.	Establish a lump-sum grant upon childbirth for women at-risk that have been subjected to invasive prenatal diagnosis	BSSR Ministry of Justice; BSSR Ministry of Finance; BSSR State Committee for Public Occupational and Social Protection; Sociology Institute, BSSR Academy of Sciences	1991
3. Measures for Prenatal Diagnosis of Congenital Developmental Defects and Inherited Diseases			
3.1.	Organize two-time ultrasound screening of all women at 15-16 weeks and 23-25 weeks of pregnancy and mandatory pathomorphological examination of aborted fetuses	BSSR Ministry of Health	1991-1995

3.2.	Organize an examination for all women at 15-16 weeks of pregnancy to determine alpha fetoprotein content and other fetal congenital developmental defect markers	BSSR Ministry of Health	1991-1995
3.3.	Organize prenatal diagnosis of the fetal karyotype in women 38 years and older	BSSR Ministry of Health; ICDSRI	1991-1995

#### 4. Neonatal Screening Measures

4.1.	Provide 100 percent screening of newborns for phenylketonuria and subsequent treatment for affected individuals	BSSR Ministry of Health	1991
4.2.	Provide 100 percent screening of newborns for congenital hypothyroidism and subsequent treatment for affected individuals	BSSR Ministry of Health; ICDSRI	1991
4.3.	Introduce total screening of newborns for adrenogenital syndrome and subsequent treatment for affected individuals	BSSR Ministry of Health; ICDSRI	1991

#### 5. Administrative Personnel Support

5.1.	Found the Scientific Practice Association (SPA) "Medical Genetics" as part of the ICDSRI and Belorussian Genetic Counseling that provides all types of genetic aid to the public	BSSR Ministry of Health	1991
5.2.	Introduce a "Medical Genetics" course into the post-diploma training program (internship) of pediatricians and obstetrician-gynecologists	BSSR Ministry of Health	1991-1992
5.3.	Establish genetics offices in all of the Belorussian oblast centers	BSSR Ministry of Health oblast executive committees; Minsk Municipal Executive Committee	1991
5.4.	Conduct a series of measures aimed at increasing the awareness of medical workers and the public about inherited diseases resulting from radiation and chemical mutagenesis	BSSR Ministry of Health; BSSR State Television and Radio; "Znaniye" Society, BSSR	1991-1995
5.5.	For purposes of investigating and applying the experience of foreign centers for offering genetic aid to the public, including ultrasound and molecular and biochemical diagnosis, annually send 2-3 doctors from genetics service establishments abroad for apprenticeship	BSSR Ministry of Health	1991-1995
5.6.	Develop recommendations on the use of equipment for minimum dose exposures for children and individuals of reproductive age and introduce these recommendations into medical establishments and enterprises that work with ionizing radiation	BSSR Ministry of Health; Belorussian Trade Union Federation	1991-1995
5.7.	Develop and introduce a computerized "Genetic Aid" system	BSSR Ministry of Health	1991-1995
5.8.	Invite qualified specialists on molecular and biochemical genetics from other cities to the "Medical Genetics" SPA for purposes of more promising scientific developments and their introduction into public health practice. Have the executive committee of the Minsk Municipal Soviet of People's Deputies provide the "Medical Genetics" SPA two offices each year for 1991-1993	BSSR Ministry of Health; Minsk Municipal Executive Committee	1991-1993



**6. Social and Legal Aspects of Prophylaxis of Congenital Developmental Defects and Inherited Diseases**

6.1.	Together with the respective ministries and departments, develop measures on the responsibility of medical workers for failure to send (delaying to send) pregnant women for prenatal diagnosis and for failure to examine (delaying examination) newborns prior to release from the maternity hospitals when these failures result in the birth of a child with a congenital developmental defect or inherited disease that could have been prevented with prenatal diagnosis or the development of disease in a child that could have been prevented by examination in the maternity hospital	BSSR Ministry of Health; BSSR Ministry of Justice	1991	
6.2.	Together with the respective ministries and departments develop measures on the responsibility of families (women) for failure to follow medical recommendations (refusing prenatal diagnosis; refusing to treat a child with an inherited disease; refusing to abort a pregnancy when fetal pathology is detected) when this results in the birth of a child with a developmental defect or inherited disease, or when it results in the disablement of a child with an inherited disease that could have been cured	BSSR Ministry of Health; BSSR Ministry of Justice	1991	
6.3.	Develop and introduce proposals to the BSSR Soviet of Ministers on the following: measures on socio-economic aid to families that organize the care and treatment of a child with an inherited disease that is detected in the preclinical stage;	BSSR Ministry of Health; BSSR Minsobes [as published]; BSSR Ministry of Finance	1991 organization of the production of low-protein content prepared foods for the correction and treatment of children with phenylketonuria	BSSR Ministry of Health; BSSR Gosselkhozprod [as published]

**7. Development of Equipment Bases for Genetics Service Institutions**

7.1.	Put into operation the Belorussian Children's Clinic and Diagnosis Center and Genetic Counseling at Clinical Hospital No. 7 in Minsk	BSSR Ministry of Health Director of Minsk Construction	1992	
7.2.	Establish genetics clinics in Brest, Vitebsk, and Grodno with a capacity of 20,000 examinations per year, and one in Gomel with a capacity of 25,000 examinations per year) Committees		1991-1995	
7.3.	Provide equipment for the genetics service institutions	BSSR Ministry of Health; BSSR State Economic Plan		

Allocations to a sum of 12.6 million rubles, including 4.5 million in hard currency, are needed from the resources allotted for the clean-up of the accident at Chernobyl in order to implement the Belorussian Program for Prophylaxis of the Genetic Sequelae of Chernobyl.

### Effectiveness of Bashkir Emergency Service Assessed

917C0387B Moscow TRUD in Russian 15 Feb 91 p 2

[Article by A. Valeyev TRUD correspondent, Bashkir SSR, under the rubric "Knowhow and Problems": "The High Price of Mistakes: Immediate Response Medical Service—'Disaster Medicine'—Started 3 Years Ago in Bashkiria"]

[Text] I must make a stipulation at the start—the physicians of Bashkiria do not use the term often because there is too wide a difference between what one strives for and what one has. Moreover, in the summer of 1989, people were no longer able to observe true professionals from the United States in action. But a fact is a fact: a service designed for physicians to work in extraordinary situations was founded in this republic and has been in operation since late 1987.

What about efficacy? Here is only one of the facts pertaining to the tragic events near Asha that has been recorded in the proceedings of the Moscow International Conference on 'disaster medicine': Evacuation of victims was completed within 24 hours to the Bashkir Medical Evacuation Service (LEN) and within 48 hours to the Chelyabinsk LEN. The death rate reached 20.3 percent in medical institutions of the Bashkir LEN and 44.0 percent in those of Chelyabinsk. Let me add that not a single casualty sent to Ufa expired en route. That very disaster medicine worked well.

Within a few minutes the senior shift physician can put out an emergency call for 45 surgical and traumatological pediatric and other regular emergency brigades, and 50 specialized medical care brigades. The administrators of the service have the right to enlist all those who are seeing patients, making rounds, or on call.... There is minimal risk, their fellow workers will take their places within 30 minutes.

These flying brigades can not only give first aid but, if necessary, also deploy a temporary hospital. They have experienced such situations many times, not only when they were in training, but during on-site responses to vehicular accidents. At first, there were some who grumbled, but they soon realized that this was not done in vain only after the tragedy near Asha. The last victim of the railroad accident that had occurred there was delivered to a temporary hospital only four hours after the accident. Yet there were somewhat more than 800 burn and injury cases, and the city was 110 km away.

True, one does not always succeed. There had been an explosion in August at the Ufa Synthetic Alcohol Plant. Upon arrival there, medical personnel spent too much time extricating themselves from a blind alley. It happened because none of the plant personnel or firemen ["gas-rescue" personnel] could properly explain what had exploded, what chemicals had been discharged. At first they started to wash the victims with water, then it was learned that alcohol was needed which, of course, was not available.

After that nerve-wracking incident, B. Sochilov, Bashkir deputy minister of health and developer of disaster medicine, arrived at a seditious conclusion: it was time to scratch existing charts and diagrams of the civil defense medical service, and instead develop a data bank with information about each Bashkir enterprise. This work is forging ahead at the present time: maps are being plotted and programs developed. The quantity of potent toxic agents, as well as season, time of day and windrose are taken into consideration. In brief, models are made of emergency situations at a given plant, factory and enterprise.

Yes, all this is necessary and important. But physicians feel helpless. They only dreamed of the ultramodern technology with which the Boeing aircraft that arrived to help last summer was crammed, just as they dream of the promised specialized helicopters and aircraft, cross-country vehicles, long-range radio stations and even a bonus for working under extreme situations. Disaster medicine is a running joke in their environment. Two cross-country vehicles based on the GAS-66, with operating tables, are their most valuable equipment, and they were obtained thanks to the efficient personnel of the local Medtekhnika [medical technology or equipment] office and ambulance drivers, rather than the nation's motor vehicle industry. Everything that they accomplish is based on bare enthusiasm and, sometimes in spite of orders of the USSR Ministry of Health. I shall not mention which ones lest definitive harm is done.

There was a time when we believed in complete certainty that trains can be derailed, aircraft could fail to reach an airport and plants could fly up in the air anywhere and everywhere except in our country. Official reports contained tragic notes, but this did not keep us from considering them to be exceptions to the rule. And it is only when too many such sad exceptions took place did it become apparent that we all live in the same flawed world and cannot think that accidents (let alone disasters) will bypass us only because we live in a nation of full-fledged socialism. But, we had to experience a number of shocks one after the other to arrive at a simple and obvious truth: it is simply imperative to have a national system of emergency response to extraordinary situations in our country. And we began to develop it.

It was decided to start with medicine. In answer to a question posed by TRUD correspondents last year, A. Potapov, RSFSR minister of health (he no longer holds this position) declared that "the USSR Ministry of Health is developing a rapid-response service." Eighteen months have gone by and it became apparent that both the Union and Russian ministries of health have had a slow reaction to the rapid response service. It can be detected only in various decrees. That's all. Much paperwork has been generated, but not a single victim has benefited from it thus far.

Secrets are no longer held about tragedies that have occurred. They could not be concealed, and also the times have changed. It is sad to state that the press and television are virtually the only sources of information for physicians about the performance of their colleagues in Arzamas, Sverdlovsk, Spitalak and Chernobyl. But they are seldom able to pick up professional information from these sources. And

for this reason they continue to learn from their own mistakes, rather than those of others. And they pay a painfully high price.

### Health of Preschool Children in a Region With an Elevated Environmental Level of Nitrates and Nitrites

917C0389A Kishinev ZDRAVOOKHRANENIYE  
in Russian Vol 6, Nov-Dec 90 (manuscript received  
19 Dec 89) pp 20-22

[Article by V. P. Chenusha, A. S. Kozlyuk and A. A. Donos, Department of Faculty and Hospital Pediatrics (director—Prof V. P. Chenusha), Kishinev Medical Institute imeni N. A. Testemitsanu, and Laboratory of Ecological and Infectious Immunology (director—Doctor of Medical Sciences A. S. Kozlyuk), Moldovan Scientific Research Institute of Preventive and Clinical Medicine]

UDC 616-053.2:614.2+613.2+546.175

[Text] Abstract: Recorded and actual (based on clinical expert examination) morbidity of preschool children was studied in two research groups, in a region with an elevated (group I) and low (group II) environmental level of nitrates and nitrites. A high frequency of pathology with a sluggish course was revealed (especially in group I). Such pathology is not adequately detected, causing it to become chronic.

Twelve bibliographic references, 1 table.

Primary prevention is a priority direction of Soviet public health. By attaining this important objective in early childhood, we can prevent various pathologies from becoming chronic, and preserve and fortify the health of the growing generation [2,5,6].

Scientific publications have appeared in recent years indicating a close correlation between morbidity in young children and the intensity of chemical use. The effect of

environmental pollution on physical development of children [4], frequent appearance of neuroses in them [3,7], elevated morbidity of preschool children [1] and other facts have been noted.

Considering that the Moldovan SSR is a republic with a developed agrarian sector making intensive use of nitrogenous mineral fertilizers, we studied the health of children with the goal of developing the appropriate measures by which to reduce morbidity. We developed and used a special comprehensive program including epidemiology, clinical treatment, immunology and other parameters characterizing pathology in the child's body. These characteristics were studied in comparison with observations on a control group. Mathematical statistics and clinical, laboratory, chemical and other research methods were employed in this case.

Preschool children (3 to 7 years old) from two regions of the republic experiencing different levels of use of mineral fertilizers—high (group I) and low (group II, control)—were adopted as the object of research.

The level of use of mineral fertilizers (kg/ha) in relation to the active ingredient (nitrogen) exceeded the republic averages by almost twice and the concentration of nitrates in local water sources exceeded the averages by five times in group I. According to published data, consumption of water with a high nitrate concentration can cause a large number of health deviations in children—alimentary methemoglobinemia for example.

The concentration of these compounds in group II corresponded to WHO standards (up to 45 mg/liter for nitrates).

An analysis and an evaluation of nosological forms observed in children of the two groups are discussed in this communication. It should be noted in this case that we took account of both recorded morbidity (stage I) and the results of clinical expert assessment of the quality of disease diagnosis (stage II), carried out jointly with specialists—pediatricians, pulmonologists, cardiologists, neuropathologists and otorhinolaryngologists.

Nosological Forms of Diseases Observed in Preschool Children

Classes of Disease (Based on Disease Terminology and Classification of the Ninth MKB Review)	Group I				Group II				Student's Test		
	Registry Data		Expert Assessment Data		Registry Data		Expert Assessment Data				
	No	%	No	%	No	%	No	%	2-4	6-8	4-8
Infectious and parasitic diseases	26	27.96	151	21.03	20	9.9	13	16.88	19.1	0.53	13.07
Diseases of the endocrine system, nutritional disorders, metabolic and immunity disorders	-	-	68	9.47	10	4.92	-	-	10.65	2.0	10.56
Diseases of the blood and hemopoietic organs	2	2.14	118	16.43	10	4.92	11	14.29	-18.26	1.22	9.45
Mental disorders	1	1.08	34	4.74	-	-	4	5.19	6.07	2.06	3.44
Diseases of the nervous system and sensory organs	7	7.53	64	8.91	10	4.92	6	7.79	8.29	1.1	5.78

Nosological Forms of Diseases Observed in Preschool Children (Continued)

Classes of Disease (Based on Disease Terminology and Classification of the Ninth MKB Review)	Group I				Group II				Student's Test		
	Registry Data		Expert Assessment Data		Registry Data		Expert Assessment Data				
	No	%	No	%	No	%	No	%	2-4	6-8	4-8
Diseases of circulatory organs	-	-	30	4.18	-	-	-	-	6.01	-	6.01
Diseases of respiratory organs	39	41.94	82	11.42	120	59.11	20	25.97	6.48	6.68	2.65
Diseases of digestive organs	8	8.6	102	14.21	11	5.41	13	16.88	-13.26	0.84	6.85
Diseases of the urogenital system	3	3.23	40	5.57	-	-	-	-	6.2	-	7.21
Diseases of the skin and subdermal cellular tissue	5	5.38	17	2.37	11	5.41	4	5.19	2.67	1.88	2.18
Congenital abnormalities (developmental defects)	-	-	10	1.39	-	-	-	-	3.26	-	3.26
Certain states arising in the perinatal period	-	-	-	-	11	5.41	-	-	-	2.17	-
Injuries and poisonings	2	2.14	1	0.14	-	-	-	-	1.78	-	1.0
Other											
Total number of cases	93	100	718	100	203	100	77	100	-	-	-
Number of observations	175	-	175	-	85	-	72	-	-	-	-

The table compares the overall results for observation groups, obtained by studying registered cases of illness and actual cases (as determined from expert assessment of diagnosis of nosological forms). The analysis showed in this case that in comparison with control group II, the number of illnesses of various pathology in children was almost twice lower in group I ( $P < 0.01$ ). This can be explained by the fact that practical physicians devoted their main attention to respiratory diseases, which were observed in a high proportion in both groups—respectively 41.94 and 51.11 percent of the cases. Disease registry data allowed us to conclude that pediatricians devoted more attention in their daily work to visible, acute pathology (pneumonia, ear, nose and throat infections etc.), and not to sluggishly proceeding, protracted pathology, which we interpreted as a consequence of inadequate registration of the latter.

An expert assessment of diagnoses made jointly with various specialists revealed a number of unique features. It was established that in comparison with the control, morbidity of preschool children in group I was four times higher ( $P < 0.01$ ). Thus the results require public health agencies to provide, on priority and with regard for specific needs, qualified pediatricians to regions of the republic with an elevated concentration of nitrates and nitrites in the environment, in foodstuffs and in water.

We were also able to significantly expand our ideas about the extent of sluggishly proceeding pathology in the observation groups. In group I for example, the proportion of diseases of the endocrine system, nutritional disorders, metabolic and immunity disorders, diseases of the blood

and hemopoietic organs, of the nervous system and sensory organs, and of circulatory and digestive organs and congenital abnormalities (developmental defects) was more than three times greater according to expert assessment data in comparison with registry data, being 63.2 percent as opposed to 18.27 percent ( $P < 0.001$ ). Hyperdiagnosis of respiratory diseases was also revealed in this case: According to expert assessment data their proportion was significantly lower than according to registry data, being 11.42 percent as opposed to 41.94 percent ( $P < 0.01$ ). Consequently the tendency we noted toward hyperdiagnosis of respiratory diseases in children in the first year of life [8] continues to be observed in preschool children, which dictates the need for also implementing organizational measures on behalf of pediatricians working with older children. Thus considering the high incidence of classes of disease with a sluggishly proceeding pathology in group I as compared to group II (that is, 60.2 percent as opposed to 38.96 percent;  $P < 0.01$ ), an elevated level of nitrates in the population center in question may have been a factor in the onset of chronic pathology. This dictates a need for studying the immunological reactivity of the child's body more deeply.

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### Medical-Social Effectiveness of Combatting Arterial Hypertension in the Rural Population

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[Article by V. I. Botnar, L. L. Kishlar and N. G. Barbakar, Moldovan Scientific Research Institute of Preventive and Clinical Medicine]

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[Text] Abstract: A program to combat arterial hypertension was implemented in two rural populations of the Moldovan SSR (1,255 persons in the experimental group and 921 persons in the comparison group).

Active detection and treatment of arterial hypertension patients in the experimental group resulted in a decrease in

frequency of arterial hypertension, a statistically significant increase in the number of effectively treated hypertension patients, a dependable decrease in total and noncardiovascular mortality, and a tendency toward lower mortality due to myocardial infarction and cerebral insult and of primary disability due to arterial hypertension and its cardiovascular complications.

### Four bibliographic references.

Ecological research showed that the incidence of arterial hypertension (AH) in the country's adult population is 15-25 percent. In this case only a small proportion of the patients receive hypotensive therapy, and even fewer of them are treated effectively. At the same time, active detection and treatment of AH patients reduces overall mortality, morbidity and mortality due to cerebral insult [1,4].

The goal of this work was to study the medical-social effectiveness of combatting AH in an unorganized Moldovan rural population.

### Materials and Methods

Two random samples of men and women, 30 to 55 years old, from two of the republic's rural population centers were examined by physicians and nurses who had undergone training in standard interviewing and arterial pressure measuring methods. The research strategy included collecting medical history data, revealing the risk factors of myocardial ischemia, filling out a WHO questionnaire for revealing stress-caused angina pectoris [3], collecting information on temporary and persistent incapacitation, taking two arterial pressure measurements and recording the resting electrocardiogram.

A program to combat AH was carried out in one of the towns. It entailed active detection and treatment of AH patients on the basis of the WHO stepped treatment system. This was the experimental group. In the other town, which served as the comparison group, AH patients and persons at risk were revealed, and traditional therapeutic and preventive measures against hypertension were implemented.

The first examination was followed by annual repeat examinations of the entire experimental group and of a 40 percent sample from the comparison group. All subjects of both groups underwent the final examination.

The effectiveness of the preventive program was evaluated on the basis of indicators characterizing the epidemiological situation with respect to AH, mortality, including due to myocardial infarction and cerebral insult, and morbidity involving temporary and persistent incapacitation. Mortality was studied on the basis of doctor's death certificates, and cases of myocardial infarction (MI) and cerebral insult (CI) were ascertained from registry documents. Morbidity involving temporary incapacitation was studied in relation to all subjects. For this purpose, data were copied from primary medical documents (hospital admissions, disease histories, outpatient cards). Disability data were obtained from materials collected by medical commissions for determination of disability and from pension cards.

## Results and Discussion

A primary screening examination was carried out on 77 percent of the experimental group (1,255 persons) and 75 percent of the comparison group (921 persons). AH was revealed in 28.3 and 27.0 percent of the subjects respectively, with the frequency being identical among men and women of both populations. Borderline arterial pressure was established in another 11.6 percent of persons in the main group and 14.1 percent in the control group. Consequently if we take account of the frequency of AH and the possibility of frequent transition from borderline arterial pressure to AH, around 40 percent of men and women of this age require active primary and secondary AH preventive measures.

When AH was present, half of the subjects (49.9 percent in the experimental group and 44.6 percent in the comparison group) were aware of their illness, only 11.0 percent of hypertension patients in the experimental group and 6.8 percent of hypertension patients in the comparison group were taking hypotensive drugs, and a therapeutic impact (reduction of diastolic pressure below 94 mm Hg) was attained in respectively 7.0 and 5.6 percent of persons with AH.

Thus high incidence of AH, low patient awareness of disease, a low percentage of persons receiving hypotensive treatment and its low effectiveness were revealed in the Moldovan rural population.

Active therapeutic and preventive measures conducted over a period of five years helped to reduce the incidence of AH in the experimental group from 28.3 to 25.7 percent, at the same time that growth in the frequency of AH from 27.0 to 29.7 percent was noted in the comparison group; however, these trends were not statistically significant.

Dynamic observation of the populations revealed a significant increase ( $P < 0.01$ ) in the number of effectively treated patients in the experimental group (up to 13.6 percent), and only a tendency for this indicator to increase ( $P > 0.05$ ) in the comparison group (up to 7.7 percent).

Awareness of illness and the percentage of patients receiving treatment increased significantly in both populations in question. Thus, after five years of the program 82.1 percent of hypertension patients in the experimental group and 78.3 percent in the comparison group were aware of their AH, and correspondingly 31.1 and 25.6 percent of AH patients were taking hypotensive drugs.

There is special interest in studying the effect of the program against AH on the mortality and incapacitation indicators of the rural population.

The average annual overall mortality in our study was higher in the comparison group (8.42 as opposed to 4.03 cases in the experimental group, per 1,000 persons per year;  $P < 0.01$ ). Noncardiovascular mortality was also higher in the comparison group (correspondingly 5.72 and 2.89 cases per 1,000 persons per year;  $P < 0.05$ ). The significant decrease in overall mortality in the experimental group can

be explained by more frequent doctor visits by patients of this group, such that diseases other than AH could be revealed and treated as well.

During the time of the program against AH, MI mortality in the experimental group was 42 percent lower than in the comparison group, CI mortality was 85 percent lower, and mortality due to all cardiovascular diseases was 57 percent lower. However, the tendency for mortality due to the indicated diseases to decrease in this group was not statistically significant.

Primary disability due to AH and its cardiovascular complications decreased in the experimental group by 44 percent in relation to the comparison group, and the number of patients put on disability due to all circulatory diseases decreased by 56 percent ( $P > 0.05$  in both populations).

Analysis of the dynamics of morbidity involving temporary incapacitation due to AH and its complications revealed growth of the number of patients, and of the number of cases and days of incapacitation in both groups. Morbidity involving temporary incapacitation due to AH and its complications totaled over all of the years of the study was significantly lower in the experimental group according to the number of patients and the number of cases of incapacitation. This difference may indicate that the clinical course of AH is more severe on the backdrop of traditional treatment in the comparison group.

Thus five years of therapeutic and preventive measures against AH revealed a significant decline in overall and cardiovascular mortality, and a tendency for lower mortality due to MI and CI and fewer disability retirements due to AH and its complications. However, considering the relatively short time span of the research (4.2 years on the average) and the insignificant number of fatal cases, all conclusions made from these results in regard to mortality and incapacitation must be treated as being tentative. Their dependability will be verified through extensive research carried out in the rural population.

The effectiveness of combatting AH in the urban population was demonstrated in population studies. For example an evaluation of the medical effectiveness of the All-Union Cooperative Program for the Prevention of AH (a group of 43,197 men 40 to 54 years old were kept under observation, for a total of 177,703 man-years of observation) showed that in just one year after the program was started, a tendency for overall mortality to decline in the experimental population in comparison with the same in the comparison group was revealed (and subsequently confirmed). By the end of the study, overall mortality had decreased by 17 percent [2].

AH prevention was found to be especially effective in regard to preventing deaths due to MI. In the five years, MI mortality was found to be 48 percent lower in the experimental group than in the comparison group. The incidence of nonfatal MI in the main group decreased by 52.4 percent [2].

Approximately similar data were also obtained in other major studies of secondary prevention of AH. In a program to reveal and observe hypertension carried out in the USA,



in five years overall mortality was 17 percent lower and mortality due to MI was 45 percent lower in the group receiving active treatment as compared to a control group.

Thus our research revealed a fundamental possibility for improving detection and treatment of AH patients in rural areas, which would reduce morbidity and mortality in the rural population.

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#### Organizational and Clinical Aspects of Preventing Urban and Rural Mortality

917C0434A Moscow SOVETSKOYE

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[Article by A. Minyayev and A. G. Fedorov (Leningrad) under the rubric "Economics and Management"]

614.1:312.2(470.23) "1979-1990"

[Text] A study was made of morbidity and mortality of residents of the Leningrad region (expected rates for 1979-1987, retrospectively for 1978-1990, and projected rates to the year 2000). The results of all censuses carried out in Leningrad (St. Petersburg) were summarized. We analyzed death certificates in base urban and rural rayons of Leningrad and the oblast (representative samples). We excerpted data from case histories pertaining to deaths in urban hospitals and the oblast clinical hospital. Prenosological and

nosological (prelethal) stages were investigated on the basis of results of an epidemiological screening of representative groups of urban and rural population (brigade method). The entire block of information totaled more than 44,000 case units. Mortality tables were plotted with a digital computer. We calculated elimination variants: hypothetical models of increase in mean life expectancy (MLE) with the exception of various causes of death. The generalized medicodemographic characteristics (method of integral calculus using Simpson's formula) yielded diagnostic screening of the dynamics of public health in intercensus intervals with consideration of age and sex structure of urban and rural population ( $\alpha$  and  $\beta$  criteria). The distinctions of modern pathomorphosis of morbidity and mortality, and involvement in its dynamics of sociohygienic factors were simulated by methods of parametric and nonparametric statistics, correlation and dispersion analysis.

Social-group differences in health status are demonstrable through analysis of elimination MLE reserves (Table 1). Even with such relative and general groupings as blue-, white-collar workers, dependents and pensioners, typical patterns are observed: while males are in the lead for elimination reserves for trauma and poisoning, the factor with the greatest expectations is found in the least socially mobile group (8.8 years), followed by blue-collar workers (5.8 years) and white-collar workers (4.1 years). Such an uneven reserve for prolonging MLE is attributable to the specifics of social burdens, lifestyle and health care. The high mortality rate related to these causes among dependents and pensioners is linked to the long-term sequelae of trauma, attempted suicide and the trauma they sustain as a result of other health problems that dramatically lower their overall adaptability, motor and psychophysiological functions; in most cases, among blue-collar workers it is related to household trauma while inebriated or severe industrial trauma incompatible with life; among white-collar workers it is related to prevalence of trauma in the home, including injury while drunk, but this mortality category is "replenished" by primary trauma sustained by blue-collar workers who transfer to the white-collar category as a result of professional readaptation. The deferred death rate for them increases the corresponding elimination reserve.

Table 1. Social-group characteristics of elimination reserves for MLE for inhabitants of the Leningrad region (results of cohort analysis, reserve expressed in years)

Cause of death	Social-group category					
	blue collar workers		white collar workers		dependents and pensioners	
	male	female	male	female	male	female
Neoplasms	2.7	1.8	3.2	2.3	3.0	3.6
Circulatory organ diseases	4.7	3.2	4.9	3.8	4.0	5.5
Respiratory organ diseases	2.1	1.1	1.3	1.5	2.3	2.3
Digestive organ diseases	0.6	0.3	0.5	0.5	0.5	0.7
Trauma, accidents, poisoning	5.8	0.8	4.1	1.2	8.8	2.9

On the general population scale, circulatory diseases are of the most importance to prolonging life: The overall effect (for males and females) in all social groups reaches 26.1 years, whereas for trauma and poisoning it is 23.6 years, neoplasms 18.6 years, respiratory disease 10.6 years, and digestive disease 3.1 years. It is remarkable that the greatest expectation for most nosological forms in the group of dependents and pensioners is found for females. In the blue- and white-collar groups males have such a possibility for increasing life expectancy. There is obvious social selectivity in pathomorphological dynamics, which means that it is necessary to increase the priority of sociomedical measures aimed at male cohorts.

Systematic (by the method of progressively increasing total) hypothetical elimination of all causes of death reveals the full potential for increasing life expectancy. This method eliminates the social-group contingency in mortality rate, and renders more obvious the biomedical conditions of human vitality. Genetically fixed sex-related differences in mortality are manifested by an age distance of 2.1-2.3 years between blue- and white-collar workers, whereas among dependents and pensioners they constituted 15-16 years. Such dimorphism of demographic indicators is related to the distinctions in formation of the dependent and pensioner group: in the male cohort there is prevalence of individuals with considerable health loss (disabled at birth, due to industrial or household trauma), and in the female cohort there is a broad stratum of relatively healthy subjects who are dependents of their husbands or parents.

By combining data on elimination reserves and integral population health indicators we are able to disclose important sociohygienic determinants (Table 2). The predominant cause of death, circulatory organ disease, is not expressed similarly in urban and rural residents. The ratio of integral blocks of urban deaths to survivals are indicative of less favorable medicodemographic trends. In recent years, analogous integral indicators for the rural and urban

population have consistently drawn closer. The same tendency is confirmed by the  $\beta$  criterion. According to the 1979 All-Union census, integral volume of deaths due to circulatory disease among rural females as related to all deaths exceeded the analogous indicators for Leningrad (43.8 versus 27.5). The stability of such ratios in subsequent years is cause for alertness. Our investigation revealed that such negative expectations of general pathomorphosis are related to increased migration of the rural population. The urbanistic potential of Leningrad emerges, in this instance, not only as a social competitor for rural regional settlements, but also as the center of formation of a healthier core of population dynamics. The positive migration balance is obtained primarily because of males and females at the most active employable ages with good adaptability and favorable biomedical resources. The social infrastructure of Leningrad provides for broader choice and satisfaction of professional-educational, cultural, motivational and behavioral sets of migrants and permanent residents; and the migration flow consists mostly of young people (their mean age is in the range of 22-24 years) who apply "competitive pressure" upon permanent residents. Such social events are instrumental in development of functional disorders and psychosomatic disease in both groups. Random screening of permanent and migrating population groups revealed that there are no major differences between nosological manifestations in most cases following a period of social and psychological adjustment. The possible health problems related to housing, domestic and occupational difficulties are apparently compensated by rather high biomedical indicators. A clinical epidemiological survey revealed that, in most cases, individuals with relatively good marks for health status decide upon a move from customary and convenient places. In the psychological profile of the immigrants there is prevalence of features such as high degree of self-respect, need to search for sensations, relatively low reactive anxiety and intropunitiveness. These features provide the individual with high migrational mobility, effective psychological protection, consistency and fortitude in overcoming the difficulties of the adjustment period.

Table 2. Number to age ratio in urban and rural mortality (for intercensus intervals, 1959-1986)

Years	Sex	Ratio of deaths from cardiovascular disease to survivors ( $\alpha$ )		Ratio of deaths from cardiovascular disease to all causes ( $\beta$ )	
		urban residents	rural residents	urban residents	rural residents
1959-1969	M	0.072	0.039	44.9	27.8
	F	0.034	0.012	43.9	35.1
1970-1979	M	0.086	0.039	32.2	27.2
	F	0.029	0.020	36.9	32.7
1980-1986	M	0.079	0.062	41.6	35.7
	F	0.021	0.031	27.5	43.8

The historical distinctions of social dynamics of Leningrad for the last 70 years have affected the process of formation of the population: among those who died in this period, up to 95 percent had made intraregional or extraregional moves in their lifetime, i.e., they were not permanent residents in the full meaning of the word. Thus, on the sociomedical level, the most of the present population of Leningrad has not yet

completed the multigeneration process of becoming permanent. Evidently, this is why the health indicators of representatives of the new flows of immigrants and permanent residents have much in common.

Table 3 is a rather demonstrative model of urban and rural health dynamics. A comparison of structural mortality

indicators to mean age at the time of death suggests the existence of overt differences in quality and sophistication of medical care rendered to the urban and rural population. That is the only way we can interpret the fact that, while there is relatively greater representation of certain causes of death, the mean age of urban death cases is older (endocrine disease, nutritional disorders, disturbances in metabolism and immunity, blood and hemopoietic organs, nervous

system and sense organs, mental disorders, etc.). A sampling survey of the quality of the medical diagnostic process in rural medical and preventive institutions revealed that the reduction in curability of a number of nosological forms depended on clinical organizational flaws. For the same reason, the mean age of deaths from all causes among males and females from rural areas is lower than for urban residents (54.51 and 68.26 years, respectively, versus, 54.83 and 68.53 years).

Table 3. Structure and mean age of urban and rural cases of death in 1976-1986

Cause of death (class of disease)	Sex	Base rayon of Leningrad		Base rayon of oblast	
		Share in structure of overall mortality, percentage	Mean age, years	Share in structure of overall mortality, percentage	Mean age, years
III, IV, VI	M	3.92	41.96	2.62	22.92
X-XV	F	3.82	44.43	2.65	33.97
I, VIII, IX	M	10.65	45.65	11.87	48.76
	F	7.19	55.39	6.09	50.53
Neoplasms	M	19.20	61.26	18.72	61.50
	F	20.62	65.26	19.80	63.36
Accidents, poisoning, trauma	M	21.35	35.33	26.47	38.89
	F	4.20	51.75	5.97	47.61
Circulatory diseases	M	44.86	64.67	40.33	65.27
	F	64.17	73.59	65.49	74.66
All causes	M	100.00	54.83	100.00	54.51
	F	100.00	68.53	100.00	68.26

Qualitative and quantitative indicators of the lethal stage among the elderly and aged are, in our opinion, just as informative as infant mortality. They characterize the state of public health on the basis of data concerning the opposite fragment of the population. For example, the extreme ages of death cases due to different causes are indicative of specifics and stages of exhaustion of biomedical resources: they constitute 91 years for men and 92 years for women with infectious and parasitic diseases, 97 and 98 years (respectively) for neoplasms, 90 and 94 years for respiratory disease, 91 and 95 years for digestive organ disease, 99 and 103 years for circulatory diseases, the figures being 73 and 84 years for myocardial infarction, 90 and 89 years for cerebrocirculatory disturbances, etc. The informativeness of such information grows when calculating overall death indicators for individuals 90 or more years old as related to the population 60 or more years of age. Such ratios for the above nosological forms are in the range of 2.0-8.6 percent. The rise in these relative values is indicative of favorable social dynamics, refinement of social and medical services, and health care organization.

As to prediction, medicodemographic analysis of the status of the population on the regional level sometimes exceeds the capabilities of clinical (even invasive) methods of examining relatively large groups. The invariance of many clinical findings in people 40 or more years of age, let alone the elderly and aged, is related to polymorphism and large

number of their inherent genetically determined nosological manifestations. Calculation was made of coefficients of association ( $r_a$ ) between intensity of mortality from different causes and presence of such widespread clinical signs as overeating, blood sugar levels, ECG results, blood pressure, morphological changes in the myocardium, etc. Age and sex differences, rather than nosological ones, turned out to be reliable, and this is indicative of minimal validity and reliability of widely used clinical prognostic signs and health status.

In summarizing the results of this study, it must be noted that medicodemographic assessments and prediction on the population level are of unquestionable pragmatic value. They arm health care practice with information that permits refinement of its clinical-organizational elements. Broad sociomedical measures aimed at controlling migration processes, improvement of the infrastructure of urban and rural communities, and establishment of an adequate health care system are of paramount importance to prevention of premature urban and rural mortality. There are plans to utilize specialized data-retrieval systems for clinical organization matters in the period of preparation toward creating an automated control system for this sector. With such developments, it is possible to keep a record of regional distinctions of public health status, coordinate health care and national economy tasks. The priority of implementation of large-scale regional, republic-level, and All-Union

programs of research and introduction is obvious, particularly if they will be integrated with the advances in clinical medicine. ©COPYRIGHT Izdatelstvo "Meditsina", 1991

**Sociomedical Characteristics of Young People at the Stage of Starting a Family**

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[Article by L. G. Kamsyuk and A. A. Sheveleva, All-Union Scientific Research Institute of Social Hygiene, Economics and Health Care Management imeni N. A. Semashko (director: Prof O. P. Shchepin, corresponding member of the USSR Academy of Medical Sciences) under the rubric "Public Health"]

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[Text] Among the pressing sociohygienic and medicodemographic problems, an important place is held by safeguarding and strengthening the health of young families, since such families determine the level and trends of birth rate and health of future generations.

For this reason, we selected a cohort of individuals who married in 1986 in the city Ivanovo as the object of our study. In forming it, we screened the cases and included only the following, in order to provide proper homogeneity: ages from 18 to 24 years, married in 1986, first registered marriage, at least three years residence in Ivanovo.

This was a multistep investigation, in the course of which we expanded the program, with concurrent reduction in size of the studied set at each successive stage.

At the first step, we followed a short program to examine the cohort of all those married for the first time (2853 couples) and prepared a brief sociohygienic description of this group. At the second step (1024 couples), we analyzed morbidity based on frequency of seeking medical care within the three years preceding marriage, investigate the brides' health status with integrated rating as to health status group, we isolated some forms of pathology that are factors of biomedical risk of pathology of the fetus and future infant. At the third step we prepared an in-depth sociohygienic description of the engaged couple, assessed their lifestyle, premarital behavior, attitude toward health, knowledgeability on family planning matters, readiness to conceive a healthy infant.

According to the results of the study, the mean age of bridegrooms in Ivanovo marrying for the first time constituted  $22.1 \pm 0.3$  years and slightly lower for brides,  $21.6 \pm 0.3$  years. On the whole, a high level of education was inherent in both the bridegrooms and brides, but the brides had a lower completion rate of higher education more often than the grooms (27.7 and 19.4 percent, respectively). Education was incomplete among a significant share of the young people at the time of marriage: 19.4 percent of the grooms were undergraduates and students, and this applied to 29.2 percent of the brides. Every eighth couple who planned to be married were students.

Virtually one-fifth of the grooms and brides (19.3 and 21.8 percent, respectively) combined studies with work, which is attributable not only to the desire of the young people to advance their education, but also their financial difficulties which did not allow them to pursue studies alone.

The investigation revealed a low starting financial level among a significant part of the young people at the stage of starting a family. Thus, 36.3 percent of the brides and 16.3 percent of the grooms had their own income of up to 75 rubles per month. Only 10.9 percent were couples, in which the bride and groom had their own income in excess of 151 rubles. The share of couples with minimal personal income (up to 75 rubles) for both the bride and groom constituted 12.8 percent. It can be assumed that after the birth of a child to such families, which would lead to a temporary absence from work for the mother, the personal income level per family member would be much lower than the minimum level, unless the couples are given financial aid by their parents.

The low income of young people at the stage of starting a family causes most grooms (73 percent), as well as brides (83 percent) to receive financial assistance from their parents; a rather significant share of both (38.8 and 44.1 percent, respectively) believed that such assistance would make up a substantial part of the young couple's budget. These data are also indicative of inadequate socioeconomic maturity of young people at the marrying stage.

More than half the future husbands were well-housed in their parents' home (more than 9 m<sup>2</sup> per person) and lived in a separate apartment. The vast majority of the couples (79.8 percent) had the same negative attitude toward living with their parents, but because of the lack of separate housing of their own, half of the newly formed families still planned to live with their parents. A total of 16.6 percent of the couples planned to rent their own housing. The others, while wishing to live separately, still did not know how they would accomplish this.

Analysis of the data on how long the couples knew each other before marriage revealed that only half of those getting married knew one another for more than a year, i.e., a time during which it is possible to learn one another's characteristics, interests, etc. The other half of the future mates knew each other for less than a year, and 15 percent, for less than six months, which seems alarming, considering the existing data about the unfavorable effect of short-term premarital acquaintance on stability of a family.

We analyzed the reasons grooms and brides wanted to marry, and their premarital behavior. The vast majority of grooms and brides (86.5 and 84.8 percent) responded that love was the main reason for getting married. Friendship and loyalty were the main reason for 8.3 percent of the grooms and 13.3 percent of the brides. One percent of the grooms and 0.5 percent of the brides got married because they were expecting a child, although, according to the medical records, at the time of submitting an application to the SAGS [civil registry office], 9.8 percent of the brides were pregnant. The difference in their answers is apparently related to the fact that, in the case of intimate relations

resulting in pregnancy between young people who love each other, they believed when filling out their SAGS application that the main reason for getting married was love, and not expectation of a child.

Analysis of premarital behavior of couples getting married for the first time revealed that sexual activity began early in the group of young people studied. Thus, 41.3 percent of the grooms and 33.8 percent of the brides had engaged in sex before reaching the age of marriage (18 years), which confirms the data pertaining to the high incidence of premarital relations at such an age (S. I. Golod, 1984). For 27.2 percent of the grooms and 39.1 percent of the brides sexual activity started at 18 to 19 years, and it began at more than 20 years for 31.5 and 27.1 percent, respectively. By the time they registered for marriage, 77.7 percent of the grooms and 65.2 percent of the brides had engaged in premarital relations, the figure for premarital sexual relations with different partners being 39.1 and 12.1 percent, respectively.

The widespread premarital sexual activity among the studied young people is a reflection of changes in their moral ideas, elimination of previously existing traditional bans on premarital sex, especially among the women. According to the answers to a questionnaire, 85 percent of the grooms and 78.7 percent of the brides considered premarital sex to be acceptable; 37.1 and 28 percent, respectively, answered it was not only acceptable, but even desirable.

Analysis of use of contraceptives during premarital intercourse revealed that only 20.5 percent of the women involved in such relations regularly used some product or method of protection against pregnancy; they were used sporadically by 16.2 percent of the brides, whereas most (63.3 percent) did not use them during their premarital affairs. Only a few brides used no contraception because of ignorance, while the rest did not consider it necessary to use them, which is indicative not only of poor information about protection against an unwanted pregnancy, but also to some extent of the lack of responsibility for the consequences of sexual intercourse. At the time of registering for marriage, 9.8 percent of the brides were impregnated due to minimal apprehension about conceiving before marriage, while 2.5 percent had a history of abortion.

Analysis of the opinion of those getting married for the first time as to the success of the marriage and future married life revealed that 72.2 percent of the grooms and 61 percent of the brides were sure that theirs would be a happy marriage. Uncertainty was voiced by only 3.5 percent of the grooms and 4.8 percent of the brides, but a considerable share of both (24.3 and 34.2 percent, respectively) had difficulty answering this question, which is indicative, to some extent, of their immaturity at the time of making the decision and starting a family.

We found several negative elements in the lifestyle of the grooms and brides: failure to adhere to a daily schedule (65.2 and 64.5 percent, respectively) and regular mealtimes (54.3 and 53.9 percent, respectively) and minimal exercise (73.2 percent of the grooms and 86.5 percent of the brides did not exercise or engage in sports). There was rather high

prevalence of bad habits in the young people: in 45.5 percent of the cases, both future mates consumed alcoholic beverages, and a significant number of young men (28.8 percent) and women (28.3 percent) began to drink at the age of 15 to 16 years. We are particularly alarmed by the fact that half the brides drank (51.6 percent); most of them (28.3 percent) began to drink at the age of development of reproductive function, 15 to 16 years.

We found that 60.9 percent of the grooms and 4 percent of the brides smoked, and virtually the same percentage of smoking grooms (38.3 percent) and brides (35.3 percent) began to smoke in adolescence, which will have a definitely negative effect on their future health. We singled out couples who both smoked. There were not many (3.8 percent); however, in more than half the couples (57.4 percent) one of the mates smoked, which is also a health risk factor for the woman and her future child.

The attitude of the young people toward their own health and, in particular, minimal medical activity at the stage of starting a family, in the period of conception and birth of a child, is particularly alarming. A total of 33.8 percent of the grooms and 30 percent of the brides did not seek medical attention for an acute illness and engaged in self-treatment; 48.4 and 47.9 percent, respectively, did not follow medical recommendations when they were sick. Almost half the brides (45.6 percent) considered it necessary to consult a physician on contraception matters, and 23 percent of them planned to start using contraceptives right after marriage. In the group of brides who did not plan to seek such consultation (43.6 percent), the vast majority planned to have their first child in the first year of marriage; there was no acute need for them to be advised about contraception at the time of their marriage.

It is important to stress that 10.8 percent of the brides did not know where to seek advice about contraception.

The attitude toward mass health screening is one of the important indicators of medical activity of the public. According to the answers to a questionnaire, only one-third of the grooms and brides, 31.7 and 34.6 percent respectively, had been screened. The following were mentioned among the chief reasons that young people were not screened: they were not called for mass screening, they considered it senseless since they believed they were in good health.

Considering the deciding influence of parental health on the health of future progeny, we investigated morbidity rate of brides and grooms as future parents. To assess morbidity of marrying couples we used as an indicator overall accumulated morbidity based on frequency of medical visits over a three year period, after which we alphabetized the charts and filed them first individually and then by couple. Morbidity rate among the marrying couples constituted 1427.2/1000 of the analyzed cohort (not counting dental pathology) according to frequency of seeking medical care; morbidity rate for grooms was 1185.6/1000 and it was higher for brides, 1666.8/1000. Gynecological morbidity constituted 45.8/1000 and andrological 19.5/1000.

One-third of the brides (33.5 percent) and one-fifth of the grooms (20.5 percent) had a chronic disease varying in course and periods of exacerbation (health group III).

Analysis of health status of future mates, with consideration of results of comprehensive assessment of health of both the



groom and bride, revealed that 26.4 percent of the couples were classified in health group I. The share of couples where both were in health group II constituted 5.7 percent and health group III 7 percent. Future mates who are both in health group III constitute the high risk group for the health of the future child. In the structure of bride morbidity, 41 percent was due to chronic pathology, which is a medical risk factor for onset of pathology in the child.

Our investigation revealed that most of the young people who were marrying for the first time were poorly informed on basic matters of marital and domestic relations, marital hygiene, family planning, health protection and conception of a healthy child. In a significant number of cases, they gained such information at random from incompetent sources.

Grooms and brides (future parents) had rather superficial knowledge about the effect of various factors on the health of the fetus and infant; and every fourth couple had extremely unsatisfactory knowledge about practical steps that should be taken before conception, 89.8 percent of the grooms and 73.5 percent of the brides did not know about the consequences of abortion; 13.9 and 12.6 percent, respectively, did not consider it a possibility with the first pregnancy.

The comprehensive sociomedical description of young people at the marrying stage, obtained from this study, enabled us to determine the sociomedical risk factors to the health of future mates and their offspring, assess the prevalence of such factors among young people on the eve of starting a family and conceiving a child, as well as to validate the main directions and concrete measures for improving sociomedical preparation of young people for marriage and protection of the health of young families. ©COPYRIGHT Izdatelstvo "Meditsina", 1991

#### Indicators of Comprehensive Health Evaluation of Rural Population of Novgorod Oblast

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[Article by V. A. Medik, Health Department of Executive Committee of Novgorod Oblast Council of People's Deputies, under the rubric "Public Health"]

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[Text] In-depth investigation of regional distinctions of morbidity, and comprehensive assessment of the health of inhabitants of different regions of the RSFSR acquire particular importance in connection with the change to new health care management systems, from sectorial to predominantly territorial forms of management.

According to its socioeconomic and medicodemographic features, Novgorod Oblast is rather typical of the Northwestern Economic Region of RSFSR [7]. Thus, the results of the comprehensive sociohygienic investigation carried out by the health department of the Novgorod Oblast executive committee, jointly with the All-Union Scientific Research

Institute of Hygiene, Economics and Health Care Management imeni N. A. Semashko, can characterize rather fully the health status of inhabitants of other analogous regions.

A total of 18,808 rural residents living in eight administrative territories (8.3 percent of the entire rural population of Novgorod Oblast) were included in the sample for the study of morbidity and actual scope of medical care; 3,464 of them had undergone an in-depth physical examination performed by brigades of medical specialists from the Military Medical Academy imeni S. M. Kirov and Leningrad Pediatric Institute; 2,412 were interrogated using questionnaires. The obtained data were processed on an ES-1022 computer using a program developed by the staff of the computer data center of the oblast health department.

The indicator of general morbidity (according to number of visits to medical care facilities) of the rural population constituted 731.6 visits per 1000 population. The highest morbidity rate was found in communities with central rayon hospitals—840.5/1000. This indicator is lower in communities with district hospitals or ambulatory care centers—652.5/1000. Medical visits by residents of settlements without medical centers is 507.1/1000. The obtained data confirmed the fact established previously by other authors that frequency of visits is a function of accessibility of medical care to the public [1-5].

The higher indicator of overall morbidity (according to number of visits) for males (770.7/1000) than females (670.0/1000,  $p < 0.001$ ) should be mentioned among the age and sex-related distinctions of the rural population with respect to medical visits, as compared to the urban population.

Analysis of different age and sex groups revealed that visits paid by women, 60 or more years of age, constituted one-half to one-third the number paid by males of the same age, since among the latter there is a larger share of veterans and invalids of the Great Patriotic War who are under dispensary observation. Sick cases found additionally as a result of the comprehensive medical examinations cancel out this difference and promote female morbidity to first place. Maximum visit rate among children is in the 1 to 2 year age group—1658.6/1000. In adults, this indicator is at a maximum for individuals 40 to 49 years of age—875.4/1000; it drops to 436.5/1000 in the group 70 or more years of age, but is still very high for men—1034.1/1000 (307.1/1000 for women).

The distinctions of age and sex structure of the rural population determine, to some extent, the structure of distribution of visits due to illness. As compared to the urban population, there is a larger share of visits related to illness made by individuals of unemployable age—17.4 percent and lower share for children—26.0 percent; the figures are about the same for the employable population—56.6 percent (for the urban population the figures are 11.5, 33.3 and 55.2 percent, respectively). The structure of the general morbidity indicator (according to visits) for the rural population also has elements that distinguish it from the structure of medical visit frequency for the urban population. While respiratory disease is in first place for



both urban and rural residents—36.4 percent, circulatory disease is in second place for rural residents—11.0 percent, whereas it is in third place among urbanites. Diseases of the musculoskeletal system and connective tissue are in third place among rural residents—8.7 percent, ahead of the category of diseases of the nervous system and sense organs (in second and fifth places among urban and rural residents, respectively). Digestive diseases are in fourth place in both groups—8.1 percent (sixth). Seventh and eighth places are held respectively by visits due to trauma and poisoning—7.0 percent, skin and subcutaneous fatty tissue diseases—4.4 percent, genitourinary system diseases—4.1 percent. These categories of disease constitute 87.3 percent of all illnesses for which visits to preventive medical institutions (LPU) were recorded in the course of a year.

As a result of comprehensive medical examinations, an average of 2085.6/1000 examined additional cases of chronic disease and conditions were detected that had been unknown from the visits paid during the year. The number of visits was increased primarily due to pathology of the nervous system and sense organs (516.43/1000 versus 55.75/1000), circulatory system (339.42/1000 versus 80.43/1000), musculoskeletal system (263.66/1000 versus 63.90/1000), skin and subcutaneous fatty tissue (69.98/1000 versus 32.36/1000). We found a significant number of various forms of speech disorders, refraction and accommodation abnormalities, varicose veins, chronic disease of the tonsils and adenoids.

The structure of chronic disease and states additionally picked up through the medical examinations indicates that there is poor accessibility of medical care to patients with such diseases, although they are widespread, as well as of the existence of illness among them that progress discretely up to a certain point without causing great concern to the

patients. Furthermore, one should also seek an explanation for the large share of additionally detected pathology classified as "exhaustive incidence" in the lack of the public's attention to their health and preventive examinations, as indicated by the results of questioning the rural residents: 27.9 percent of those interrogated assessed their health as being good, 59.8 percent considered it satisfactory, and only 12.0 percent assessed it as poor or very poor. Moreover, 62.4 percent were convinced that they had no chronic disease. In answer to the question of attitude toward visiting a physician for preventive purposes, 33.7 percent stated that preventive visits do not improve health, 17.0 percent saw no practical purpose to them, and only less than half, 46.6 percent, noted that such visits are necessary. In answer to the question "Would you go to a polyclinic if you did not have to get a sick leave certificate?" 39.5 percent responded in the negative.

Information about chronic disease and conditions gained in the course of the physicals was submitted to multilevel expert evaluation, including distribution of detected cases of chronic disease and conditions according to severity, final rating of the examined individuals in health groups, determination of need for various forms of medical care. The experts found 1341.4 cases (per 1000 examined), or 64.3 percent of the newly diagnosed cases had a disease that required treatment or medical supervision. We used these data in our subsequent planning and standard-setting calculations.

Of all the cases of chronic disease and conditions diagnosed during the physicals, functional and morphological deviations constituted 46.4 percent (group II severity). The other diseases and states were distributed as follows: 47.5 percent compensated chronic disease (group III), 5.8 percent sub-compensated chronic disease (group IV), 0.3 percent de-compensated chronic disease (group V severity) (Table 1).

**Table 1. Distribution according to severity of diseases detected in rural residents by comprehensive medical examinations, percentages**

Class of diseases	Severity group				
	II	III+IV+V	III	IV	V
Infectious and parasitic diseases	83.0	17.0	13.9	3.1	—
Neoplasms	59.0	41.0	34.1	6.0	0.9
Diseases of endocrine system, nutritional disorders, metabolic and immunological disturbances	63.3	36.7	33.2	3.5	—
Hematological and hemopoietic organ diseases	43.3	56.7	50.5	6.2	—
Mental disorders	77.4	22.6	21.3	0.6	0.7
Diseases of nervous system and sense organs	75.2	24.8	22.8	1.8	0.2
Circulatory diseases	4.4	95.6	78.3	16.7	0.6
Respiratory diseases	38.7	61.3	55.5	5.4	0.4
Digestive organ diseases	16.2	83.8	79.6	4.1	0.1
Genitourinary system diseases	21.6	78.4	74.8	3.6	—
Complications of pregnancy, labor and postpartum period	50.0	50.0	50.0	—	—

**Table 1. Distribution according to severity of diseases detected in rural residents by comprehensive medical examinations, percentages (Continued)**

Class of diseases	Severity group				
	II	III+IV+V	III	IV	V
Diseases of the skin and subcutaneous fatty tissue	74.8	25.2	25.2	—	—
Diseases of musculoskeletal system and connective tissue	21.9	78.1	71.8	6.1	0.2
Congenital abnormalities	44.2	55.8	46.2	9.6	—
Symptoms, signs and vaguely described states	67.6	32.4	23.0	9.4	—
Trauma and poisoning	19.8	80.2	46.9	30.2	3.1
All classes	46.4	53.6	47.5	5.8	0.3

The share of chronic diseases and conditions ranked by experts in severity groups III, IV and V is higher among females (56.3 percent) than males (49.7 percent). According to the severity of the diseases, analysis of the distribution of diseases in different age groups clearly shows an increase of age in severity group III-V diseases and states (22.9 percent at 0-14 years of age, 71.7 percent at 70 or older) and decrease in share of group II (77.1 percent at 0-14 years, 28.3 percent at 70 and older).

With respect to different classes of pathology, minimal values for the indicators of specific diseases and states referred to group II severity are in reference to circulatory disease—4.4 percent and maximum values, to the class of infectious and parasitic pathology—83.0 percent.

Group II cases significantly above the mean level were: dermatophytosis—93.0 percent, abnormal refraction and accommodation—83.1 percent, infections of the skin and subcutaneous fatty tissue—83.3. Maximum share of pathology referred to group III was attributable to active and chronic rheumatic heart disease—74.2 percent, hypertensive disease—80.7 percent, bronchial asthma—70.0 percent, gastritis and duodenitis—97.1 percent, and lumbosacral radiculitis—97.2 percent.

Most of the cases of atherosclerosis—44.4 percent, chronic bronchitis and pulmonary emphysema—26.9 percent, and tuberculosis—45.5 percent were classified in group IV.

In severity group V, trauma and poisoning—3.1 percent and malignant neoplasms—7.1 percent constituted the largest share.

The practical value of information thus obtained lies in the fact that conditions are provided for a differentiated approach to determination of the required scope of medical and drug care and its estimated cost, as well as planning material and manpower resources for implementation of dispensary observation.

Data on the distribution of individuals (for which information had first been gathered concerning visits to LPU and comprehensive medical examinations) in health groups is very important to comprehensive evaluation of public health. The obtained data indicate that, in the structure of the entire rural population, healthy and essentially healthy individuals (group I-II risk factors) constitute 33.5 percent and the sick (groups III-V) 66.5 percent. Among the sick cases, 52.3 percent have chronic pathology but their functional capabilities are essentially intact (group III); 13.5 percent suffer from protracted (chronic) diseases, developmental defects, sequelae of trauma, with diminished functional capabilities (group IV); 0.7 percent consisted of seriously ill cases, group I-II disability (group V) (Table 2).

**Table 2. Age and sex distribution of rural residents according to health group, who visited LPU and underwent a comprehensive medical examination, percentages**

Age, years	Sex	Health group					
		I	II	III+IV+V	III	IV	V
0-14	M	41.9	42.1	16.0	14.6	1.3	0.1
	F	38.7	42.0	19.3	18.3	0.9	0.1
	Both	40.4	42.1	17.5	16.3	1.1	0.1
15-19	M	50.0	26.4	23.6	21.7	1.9	—
	F	33.3	37.3	29.4	28.4	1.0	—
	Both	41.8	31.8	26.4	25.0	1.4	—
20-29	M	30.1	33.2	36.6	34.3	2.3	—
	F	11.7	31.3	57.0	53.6	3.4	—
	Both	20.3	32.2	47.5	44.6	2.9	—

**Table 2. Age and sex distribution of rural residents according to health group, who visited LPU and underwent a comprehensive medical examination, percentages (Continued)**

Age, years	Sex	Health group					
		I	II	III+IV+V	III	IV	V
30-39	M	14.4	31.5	54.0	49.0	5.0	—
	F	7.4	18.2	74.4	69.8	4.6	—
	Both	10.9	24.8	64.2	59.4	4.8	—
40-49	M	4.2	19.2	76.6	66.4	8.4	1.7
	F	2.9	11.6	85.6	71.1	13.7	0.7
	Both	3.6	15.5	81.0	68.7	11.0	1.2
50-59	M	0.6	3.8	93.6	65.3	27.1	1.2
	F	0.5	4.6	94.9	61.1	33.6	0.2
	Both	0.5	5.1	94.3	63.0	30.7	0.7
60-69	M	—	—	100.0	38.2	55.5	6.4
	F	—	0.6	99.4	58.3	39.4	1.7
	Both	—	0.3	99.7	50.7	45.5	3.4
70 & older	M	—	—	100.0	25.0	65.9	9.1
	F	—	—	100.0	35.9	61.5	2.6
	Both	—	—	100.0	32.0	63.1	4.9
Totals	M	18.4	23.0	58.6	45.8	11.8	1.0
	F	10.1	15.8	74.1	58.6	15.1	0.4
	Both	14.2	19.3	66.5	52.3	13.5	0.7

Healthy and essentially healthy children constituted 82.5 percent and the sick, 17.5 percent. This ratio changes with age in the direction of decrease in share of healthy children and increase in that of sick ones. At 60 or more years of age, 99.7 percent suffer from some chronic disease.

We found that 73.0 percent of the population of working age (20-59 years) suffered from chronic diseases. Of this number, 58.3 percent were classified in group III, 14.0 percent in IV and 0.7 percent in health group V.

A larger number of healthy and essentially healthy people was found among males—41.4 percent (25.9 percent for females) and, accordingly, a larger share of sick women—74.1 percent (58.6 percent for males).

To go further into depth with the data obtained in the course of this study, we investigated the distribution of the public suffering from chronic disease according to share of existing disease by calculating burdens of 1, 2, 3 and more chronic diseases subject to treatment and dispensary observation. Such an approach had been used previously for a comparative evaluation of level and structure of morbidity in different territories [6]. We found that the indicator of chronic disease burden was a function of age: in the older groups, there was a larger share of individuals with 2, 3, 4 or more chronic diseases. In the 20 to 29 year age group, the share with three or more chronic diseases constituted less than one-tenth of all sick cases. The share undergoes a 4-fold increase among those who are 60 and older.

The age and sex indicators of the burden of chronic pathology thus calculated not only expand existing methodological approaches to comprehensive assessment of public health, but also could serve as additional information for determination of public need for various forms of care.

As a result of the forthcoming shift of different territories and regions to the principles of autonomous management and cost accounting, local councils of people's deputies will have at their disposal the bulk of resources needed to implement comprehensive and proportionate development of health care, with due consideration of the specifics of regional problems of health care and what it would cost to solve them.

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# **A New Form of Rehabilitating Sick Children in Preschool Institutions and Its Efficacy**

917C0434D Moscow SOVETSKOYE  
ZDRAVOOKHRANENIYE in Russian No 1, Jan 91  
(manuscript received 24 Mar 89) pp 36-37

[Article by A. S. Rudnev, S. D. Aniskovets, T. M. Dotsenko, V. N. Shterlyayev, and L. V. Buteva, Department of Social Hygiene and Health Care Organization, Donetsk Medical Institute imeni Gorkiy, under the rubric "Advanced Experience"]

UDC 616-053.4-036.868.07

[Text] Formation of a child's health is determined largely by the preschool institutions, how they are equipped, medical and pedagogic measures.

We chose incidence of disease, the level of which is particularly high due to the age-related distinctions of their immune system, as the main criterion for assessing the children's health status. On the other hand, recurrent respiratory diseases, which sensitize the body to viral and bacterial allergens and proteins from the inflammation site, raise the threshold of child sensitivity to all sorts of adverse environmental factors, especially in large industrial cities [3, 6, 7].

Childhood diseases also involve disruption of the mother's work rhythm or interruption of her studies. This is associated with greater difficulties for the child, which are related to deadaptation to creches. The need for frequent medical care of children increases the work load on the outpatient sector, which disrupts the ratio between preventive and therapeutic work of the pediatrician [1]. The highest morbidity among children is noted in the second year of life [6], particularly among those who attend preschool institutions. However, it was established that the cause lies not only in the change in child-rearing conditions, but also the fact that, in 15-20 percent of the cases, there is failure to seek medical attention if the course of an acute disease is mild in infants reared at home.

The new form of organization of medical care we propose for organized groups of children of creche age not only lowers morbidity among them by the above 15-20 percent, but also shortens absences, which reduces the risk of deadaptation and, consequently, lowers morbidity at preschool institutions [2, 4].

Basing ourselves on the frequency of illness among children, we re-formed creche groups according to their sick-list composition into three instead of four groups in the creche sector of a child center. The space gained was used to organize inpatient treatment of children at the preschool institution. A separate entrance permitted complete isolation of the sick from the well children. Care was administered by the same personnel, whereas a revision of the staff roster at the pediatric polyclinic enabled us to provide for an additional nurse. The department has physiotherapy equipment, massage and treatment rooms, the additional funds for acquisition of which were allocated by the managing enterprise, whose interest is due to the positive changes in child morbidity within just a year of operating this facility. Children are taken as inpatients after the acute period of respiratory disease (5-6 days). Faithful adherence to the specifics of all elements of patient care by the department's personnel, wise and adjusted diet, prompt, full and comprehensive treatment enable the child to recover completely without undergoing deadaptation to the group situation. On the other hand, the lack of necessity for extending hospitalization for up to two weeks dramatically reduced absenteeism at the enterprise related to the care of sick children.

The data in the table attest to the efficacy of this method.

**Dynamics of child morbidity at creche age at children's center No 126**

Year	Number of sick cases recorded per 100 children	Mean number of days of absence per child
1987	322.5	22.0
1988	311.4	23.9

While incidence declined by 8 percent, the mean number of days over this short period of time did not have a tendency toward decline, and this is related merely to the opportunity to have a long paid leave to care for sick children rather than to formation of a "protracted illness" group.

The new form of nursing children back to health has gained the broad support of public, state, and agency organizations, and at the present time the decision is being adopted to organize such child care on a wider scale.

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**All-Union Conference With International Participation on 'Biomedical Aspects of Mental Health' (3-6 April 1990, Tomsk)**

917C0434E Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 1, Jan 91 (signed to press 17 Dec 90) p 76

[Article by P. P. Balashov (Tomsk) under the rubric "Current Events"]

UDC 616.89-084:061.3(47+57)"1990"

[Text]The main purpose of the conference, which was organized by the Scientific Research Institute of Mental Health of the Tomsk Research Center of the USSR AMS [Academy of Medical Sciences], was formulated by the institute's director, V. Ya. Semke, corresponding member of the USSR AMS, as the scientific analysis of the status of mental health and development of effective steps to safeguard it.

The importance of the problem attracted the attention of a number of prominent foreign scientists, including the director of the mental health division of WHO N. SARTORIUS, president of the Worldwide Association of Psychiatrists K. STEFANIS, professors W. Krechmer and S. Mitzlaff (FRG), Yu. Raychani (CSSR) and Sh. Dorzhzhadamba (Mongolia), as well as prominent Soviet psychiatrists and drug abuse specialists.

The papers that were delivered summed up the results of research on three main clinical problems of psychiatry: borderline mental disorders, schizophrenia and alcoholism. The distinctive feature of the papers was their clinical

orientation, possibility of application in both clinical practice and organizational psychiatry. The conference participants praised highly the new organizational forms of psychoprophylactic care developed by scientists of the Scientific Research Institute of Mental Health of the Tomsk Research Center (TRC), USSR AMS, which have been adopted in health care practice. They include the oblast (kray) center of borderline states (V. YA. SEMKE), Center for Safeguarding Mental Health at Industrial Enterprises (B. S. POLOZHIY), and Municipal Psychohygienic Consultation Office (P. P. BALASHOV).

The All-Union conference stressed the national and socio-medical importance of safeguarding the public's mental health. Implementation of complicated tasks pertaining to this problem requires comprehensive multidisciplinary research on the etiology, pathogenesis, symptomatology, epidemiology, therapy, rehabilitation and prevention of mental illness. The results of such research would permit optimization of early detection, therapy and prevention of mental diseases and specialized care of the stricken. International collaboration of Soviet and foreign psychiatrists could serve to improve the efficacy of scientific programs for safeguarding mental health.

The All-Union conference recommended that special attention be given to humanizing psychiatry, protecting the legal interests of patients, psychohygienic education of society, broad involvement of state, public, charitable and religious organizations, prominent scientists and cultural figures in implementing the mental health programs. In this connection, dynamic clinical, clinical-epidemiological, preventive and rehabilitative, sociopsychological, medico-anthropological, immunological and genetic approaches to implementations of scientific mental health programs should acquire special importance. It was recommended to the World Health Organization to include the Institute of Mental Health, TRC, USSR AMS directly in international transregional mental health programs.

The discussion that took place on the last day of the conference was very fruitful. It dealt with many pressing problems of Soviet psychiatry and drug abuse. The question was also raised of organizing a new periodical, VESTNIK PSIKHIATRII [Herald of Psychiatry], based at the Institute of Mental Health TRC, USSR AMS.

Many prominent psychiatrists and drug abuse specialists of Moscow, Leningrad, Tomsk, staff members in departments of psychiatry and drug abuse in Siberia and the Far East, and foreign guests participated in the discussion. ©COPYRIGHT Izdatelstvo "Meditsina", 1991

**'Polifoska' Used to Decontaminate Radioactive Soil**

917C0387A Moscow PRAVDA in Russian 18 Jan 91  
2nd p 3

[Article by A. Gromov: "A Drug for ... Radiation: The Mineral Fertilizer Polifoska is Effective Against Soil Contamination," first two paragraphs are PRAVDA introduction]

[Text] Neither speeches nor brilliant oratorical articulation can ease the harm inflicted on the soil which the 20th century's most terrible disaster has "impregnated" with isotopes instead of wheat. A most dangerous psychological factor has emerged, for the impression prevails that radioactivity is fatally indestructible, and many residents of the disaster zone appear to have become reconciled with the idea that they will have to undergo mutations, like the Drosophila flies, in order to survive.

What can be done?

There is some logic to the fact that the residents of Leningrad, who survived the terrors of blockade, actively responded to the cries of Ukrainian land stricken with radiation sickness. The specialists of Lenniigipromkhim [Leningrad State Institute for the Planning of Basic Chemical Industry Plants] developed the chemical, polifoska, which is active against isotopes.

N. Antonov, candidate of chemical sciences and senior scientific associate at the Scientific Research Institute states that "the Kuybyshevskiy Production Association set up polifoska production as far back as seven years ago. The Khimprom PO [Production Association] in Dzhambul has been furnishing it since 1975. At first, the problem was to furnish our invention, which acquired the "status" of fertilizer, to agricultural land of Kazakhstan in other regions close to it. But then some news came to us from France. There, potassium is used to get rid of cesium. Why not "prescribe" our product, which contains these elements, on territory contaminated with radioactive substances? We should like to be heard by those for whom polifoska is a vital necessity. After all, Chernobyl was a global disaster affecting all of mankind. Much energy has been wasted on discussions of an assistance program for that long-suffering zone, but there is a wide gap between words and concrete deeds. Questions will be put, and suggestions will be offered....

[Gromov] On what scale?

[Antonov] The Kuybyshev enterprise can furnish 3,000-5,000 tons per year and the one in Dzhambul, 15,000-20,000.

[Gromov] Well, as they say, how does one 'take' your polifoska?

[Antonov] To avoid contamination of plants with radioactive cesium-134 and strontium-90, it is necessary to apply fertilizer containing slowly dissolving harmless compounds of potassium, calcium and magnesium to the soil. These substances drive out radiation, so to speak. It is assimilated essentially by verdure, leaving cesium and strontium in the soil and in time they undergo decay. Polifoska granules are among the first agents for removing the radioactive "plague" from the soils of the Chernobyl zone. One ton of this fertilizer costs from 138 to 167 rubles.

The addresses of the producing enterprises are: Dzhambul, Khimprom PO, phone 3-25-72. Tolyatti, Kuybyshevskiy PO, phone 29-45-63. Chimkent, Fosfor PO, phone 3-56-09.

[Gromov] Nikolay Andreyevich, what are the prospects for producing this miracle drug for soil?

[Antonov] There are plans to put new capacities in operation. In particular, at the Chimkent Fosfor PO. This is being done with Chernobyl in mind, and we feel its calamity as we would upon approaching a fire.

**Ascorbic Acid Decreases Mutation Transformations in Workers Exposed to Heavy Metals**

917C0421 Moscow DOKLADY AKADEMII NAUK  
SSSR in Russian Vol 316 No 3, Jan 91 (manuscript  
received 13 Sep 90) pp 739-743

[Article by G. D. Zasukhina, L. V. Chopikashvili, L. A. Bobyleva; Institute of General Genetics imeni N. I. Vavilov; USSR Academy of Sciences; Moscow; Severo-Osetinsk University imeni K. L. Khetagurov; Vladikavkaz]

UDC 575.224.46.044

[Abstract] A study of the effect of ascorbic acid on lymphocytes of workers exposed to salts of heavy metals, especially the molybdenum salt ammonium molybdate, involved examination of formation of chromosomal aberrations and sister chromatid exchanges in persons working from three months up to 1.2 years in a molybdenum plant. A study of the capacity of lymphocytes to repair DNA injuries caused by ammonium molybdate and of the process of formation of DNA ruptures and their resynthesis in lymphocytes before and after doses of 0.5 g of ascorbic acid for one month showed the clear-cut antimutagenic effect of ascorbic acid, demonstrated by criteria of formation of spontaneous and induced levels of chromosomal aberrations and sister chromatid exchanges, spontaneous sensitivity of DNA and that induced by mutagens and by indicators of reactivation of smallpox vaccine virus. Further study of the use of ascorbic acid in treatment of workers exposed to heavy metals was recommended because it is completely harmless to man. Figures 2; references 13: 8 Russian, 5 Western.



**Kiev City and Oblast Roentgenologists and Radiologists Meet***917C0575A Kiev VRACHEBNOYE DELO in Russian No 12, Dec 90 pp 105-106*

[Article by D.S. Mechev, V.A. Baraboy, and V.T. Demin, Kiev, under the "In Scientific Societies" rubric: "Information About the Meeting of the Kiev City and Oblast Scientific Society of Roentgenologists and Radiologists"]

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[Text] A discussion of the "Statement of a Group of Scholars Working in the Field of Radiation Safety and Radiation Medicine in Connection With the Situation Caused by the Accident at the Chernobyl AES," which was published in the journal MEDITSINSKAYA RADIOLOGIYA [Medical Radiology] (No 1, 1990, pp 7-9), was held at the Kiev Scientific Research Institute of Oncology of the UkSSR Ministry of Health on 11 April 1990. Invited to participate in the discussion were well-known domestic scholars and specialists from Kiev (from the All-Union Scientific Center of Radiation Medicine of the USSR Academy of Medical Sciences; the All-Union Scientific Research Institute of the Hygiene and Toxicology of Pesticides, Polymer Materials, and Plastics of the USSR Ministry of Health; the Oncology Scientific Research Institute, Otorhinolaryngology Scientific Research Institute, Endocrinology Scientific Research Institute, Cardiology Scientific Research Institute, Orthopedics Scientific Research Institute, and Urology Scientific Research Institute of the UkSSR Ministry of Health; the Institute of Nuclear Research, the Institute of Oncology Problems imeni R.Ye. Kavetskiy, the Cybernetics Institute, and the Plant Physiology Institute of the UkSSR Academy of Sciences; the Biophysics Institute of the USSR Ministry of Health; the Physicians Training Institute of the USSR Ministry of Health; and city clinics). Also invited were scholars and specialists from Moscow (from the Atomic Energy Institute imeni I.V. Kurchatov of the USSR Academy of Sciences, the Biophysics Institute of the USSR Ministry of Health, and the National Committee for Radiation Protection) and Kharkov (the Medical Radiology Scientific Research Institute of the UkSSR Ministry of Health). Scholars and specialists from the roentgenology and radiology departments of the Kharkov, Odessa, and Lvov medical institutes and from Uzhgorod University were also invited. Also taking part in the society's work were domestic workers from the UkSSR Ministry of Health, the Kiev and oblast health departments, the oblast sanitary and epidemiological station, members of the press and radio, and members of informal organization (Chernobyl, Zeleniy svit, and Rukh). There were more than 200 persons in all.

The goal of the discussion was to conduct a comprehensive discussion of the concept of "35 rem for life" that was formulated in the statement as the scientific basis for standardizing radiation loads for the populations of the regions suffering from the accident at the Chernobyl AES.

L. P. Kindzelskiy, deputy director of the Kiev Scientific Research Institute of Oncology, opened the discussion with

a report. He summarized the results of a four year observation of the health status of the individuals who took the first emergency measures, who were evacuated from the 30-km zone, and who live in the monitored regions of the Kiev, Zhitomir, and Chernigov oblasts. It is shown by way of illustrations that the changes in the bodies of those victimized were much more pronounced than predicted from dosimetry data.

Twenty-six persons took part in the discussion of the statement and report. Fundamental differences were noted in the specialists' views toward the scientific validity of the concept of "35 rem for life" and the feasibility of using it in practice.

Six speakers were in either complete or partial agreement with the concept. They included the coauthors of the statement G. M. Avetison and Yu. V. Sivintsev (Moscow) and M. I. Rudnev, I. A. Likhtarev, and V. A. Buzunov (Kiev, All-Union Scientific Center of Radiation Medicine). A common feature of these speeches was their attempt to minimize the danger of radionuclide contamination of the country's territory as a result of the Chernobyl accident and their attempt to "smooth things over." The discussion participants stated that the speeches of those advocating the concept of "35 rem for life" did not present convincing scientific substantiation or experimental proof of the concept.

The overwhelming majority of the discussion participants stepped forward with active objections to the concept. The radiobiologists L. B. Pinchuk, Ya. I. Serkis, and N. A. Druzhina (Kiev) presented numerous data obtained regarding animals that had spent their entire lives at the experimental bases in Chernobyl or Kiev. Significant reductions in the animals' life spans and increases in their frequency of tumorous diseases were discovered.

The nuclear physicists A. G. Zelenkov (Moscow) and A. E. Melenevskiy and Ye. V. Korbetskiy (Kiev) noted the inadequacy and imprecision of computations of dose loads in the post-Chernobyl period due to the uniqueness of the radionuclide spectrum and the flaws in mass dosimetric measurements in the first days and weeks after the accident. The erroneous nature of the estimates of integrated radiation loads with respect to just the cesium 137 content (not even considering strontium 90, cerium 144, ruthenium 106, or the transuranium elements) was pointed out.

V. A. Baraboy (Kiev) stated that the concept of "35 rem for life" is incorrect and unsubstantiated as an addition to the radiation loads permitted by the Radiation Safety Standards for a limited portion of the population (category B). He also stated that it is unacceptable to break up dose loads of as much as 100 rem into "small doses" or "shift" the main portion of a reduced dose to a short initial period. He emphasized that the synergism of radiation-induced and non-radiation-induced injury is most significant in precisely the low-dose range and that this makes it necessary to revise the principles of standardizing them and to introduce coefficients allowing for the synergism of two or more hazards. The presenter read the "Address to President of the USSR M. S. Gorbachev and to the Supreme Soviets of the USSR,

RSFSR, UkSSR, and BSSR," which was approved by the participants of the All-Union Conference on the Genetic Consequences of the Accident at the Chernobyl AES (Pushchino, March 1990). He proposed that it be supported, that the concept of "35 rem for life" be considered unacceptable, and that the old standard of "0.5 rem for life" be preserved.

The speeches presented by representatives of clinical medicine, i.e., by N. I. Pilipenko (Kharkov), I. K. Didenko, V. V. Shidlovskoy, and O. F. Melnikova (Kiev), and others, presented numerous observations and results of mass examinations that confirmed the leading role of the radiation factor in the development of immunologic, hematologic, and other impairments of the health status of the adult and especially the pediatric population of the monitored regions.

In their speeches, the radiologists and biochemists representing informal community organizations (N. I. Bidzilya, N. Ye. Preobrazhenskaya, and G. V. Reshetnyak) gave very negative assessments of the concept and the positions of scholars supporting it. A. E. Melenevskiy communicated that an independent commission of experts of the USSR Gosplan rejected the concept of "35 rem for life" as unacceptable and antiscientific.

At the conclusion of the six hour discussion, D. S. Mechev, who was presiding (he is the president of the society) noted its undoubted significance. He pointed out that irresponsible statements lay at the foundation of the concepts of "35 rem for life" and breaking 100 rem up into "small doses." In an article published in MEDITSINSKAYA GAZETA [Medical Gazette] on 30 March 1990, for example, P. V. Ramzayev (director of the Radiation Hygiene Scientific Research Institute) states that the radiation situation in Pripyat is currently good enough to allow people to live there permanently. But the soil is contaminated to a level far in excess of 40 Ci/km<sup>2</sup> just with respect to cesium 137. During the course of the four years since the accident, several scholars from Moscow, Leningrad, and Kiev (representatives of the All-Union Scientific Center of Radiation Medicine) have continued to minimize the hazard of the accident's consequences. On the one hand, this disorients the public, and on the other hand, it justifies the absence of timely measures to resettle the inhabitants of a number of regions.

D. S. Mechev read the following draft of a resolution that was supported by those present:

1) The concept of "35 rem for life" is to be considered antiscientific and unacceptable for the republic because this has a deleterious effect on the health of the population of the UkSSR. It does not give consideration to the following: 1.1) contamination with respect to cerium 144, ruthenium 106, strontium 90, or the transuranium and other elements in the dose load; 1.2) the role of the inhalation factor and "hot particles"; 1.3) consumption of locally produced products resulting in radiation injury to the alimentary canal; and 1.4) doses of short-lived radionuclides incurred by people at the moment of the accident;

2) In view of the aforesaid, this concept cannot be adopted as a criterion for resettling inhabitants out of the Chernobyl AES accident zone;

3) The address to President of the USSR M. S. Gorbachev and the Supreme Soviets of the USSR, RSFSR, UkSSR, and BSSR that was signed by the participants of the All-Union Conference on the Genetic Consequences of the Accident at the Chernobyl AES (Pushchino, March 1990) is to be supported;

4) The concept of equivalent dose in the existing Radiation Safety Standards should be replaced by the effective equivalent dose in accordance with the recommendations of the scientific commission on the effect of atomic radiation of the United Nations and International Commission on Radiological Protection;

5) A national commission on radiological protection should be created in the republic to independently solve the problems of the radiation situation in the territory of the UkSSR and to take measures to protect the public;

6) The editorial staff of the journals RADIOBIOLOGIYA, MEDITSINSKAYA RADIOLOGIYA, and VRACHEBNOYE DELO should be asked to publish a response to the discussion. The UkSSR Ministry of Health, the UkSSR Council of Ministers, and the UkSSR Supreme Soviet and a number of press publications should be informed of the resolution adopted at the society's meeting.

**First Congress of the Moldovan SSR Public Health Workers Trade Union Devoted to the Problem of Human Environment and Health Protection**

917C0389C Kishinev ZDRAVOOKHRANENIYE  
in Russian Vol 6, Nov-Dec 90 p 55

[Unattributed article from the First Congress of the Moldovan SSR Public Health Workers Trade Union]

[Text] In 1987 (20 January, 16 April, 23 September) the editors of the journals OKROTIRYA SENETETSIY and ZDRAVOOKHRANENIYE conducted a roundtable discussion that thoroughly examined the problems of protecting human environment and health with the participation of the republic's leading scientists and specialists in this field. Specific scientifically substantiated recommendations directed at improving the ecological situation in the Moldovan SSR and optimizing the human environment were drawn up and adopted in the last meeting (23 September 1987).

These conclusions and recommendations were published in the journal (No 1, 1988), and they were forwarded to interested ministries, departments and scientific and other institutions.

A decision was made at the final meeting (September 1987) to reconvene three years later in a special conference in order to examine the progress in implementing the recommendations.

Such a meeting was held on 7 June 1990.

The introductory remarks were given by the journal's editor-in-chief, V. Ya. Negresku.

Reports were given on the sanitary state of soil by Moldovan Academy of Sciences Academician A. F. Ursu, on the condition of ambient air by Moldovan SSR Academy of Sciences Academician S. I. Toma, on the condition of water sources by senior scientific associate, Candidate of Chemical Sciences V. M. Ropot, and on the health of the population by docent, Candidate of Medical Sciences V. S. Yakim.

It was noted in the reports and debates (V. S. Vangeli, A. F. Vasilos, G. F. Vylegzhanina, T. N. Golenko, I. A. Krupennikov, G. V. Merenyuk, I. T. Russu-Lupan, V. V. Slastikhin, G. K. Sprinchan, M. I. Stechenko, M. A. Tsurkanu, I. G. Shroyt etc.) that the recommendations adopted previously continue to be important, scientifically substantiated and realistic, and that they did not require review at this time. Many scientific research institutions began efforts to study ecology and the ecological situation. However, the research results are not enjoying sufficient practical use. In all other directions, the recommendations are being carried out unsatisfactorily, or they are not being carried out at all. As a result the ecological situation in the republic remains critical. Not only has it not stabilized, but according to some indicators it continues to worsen. Public health indicators are declining.

The conference participants came to the following conclusions:

1. The recommendations adopted in 1987 continue to be important. There are no grounds for making any corrections at this time.

2. Not only these recommendations but also a long-range comprehensive program of nature protection adopted in 1987 by the Moldovan SSR Supreme Soviet are being fulfilled unsatisfactorily. At the same time not only has the ecological situation failed to stabilize, but according to some indicators it continues to worsen. The republic's public health indicators are declining.

3. The conference participants feel that it would be especially important for the Moldovan SSR Supreme Soviet to adopt a law on the responsibility of ministries, departments, enterprises, institutions and citizens for ecological crimes.

It was decided to forward the conclusions of this conference to the Commission for Ecological Problems of the Presidium of the Moldovan SSR Supreme Soviet and to publish them in the journals OKROTIRYA SENETETSIY and ZDRAVOOKHRANENIYE. ©COPYRIGHT: Zdra-  
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**First Congress of the Moldovan SSR Public Health Workers Trade Union**

917C0389D Kishinev ZDRAVOOKHRANENIYE  
in Russian Vol 6, Nov-Dec 90 pp 56-58

[Unattributed article from the First Congress of the Moldovan SSR Public Health Workers Trade Union]

[Text] The Moldovan SSR Public Health Workers Trade Union held its first congress on 28 August 1990.

A report on the work of the medical workers trade union in the period following the 19th Election Conference was given by V. N. Benu, chairman of the republic committee of the medical workers trade union. It was noted that the republic committee of the medical workers trade union and its presidium made efforts to improve administrative structure, to raise the independence of primary trade union organizations and to reorient practical activity toward protecting the legal rights and interests of laborers. Special attention was devoted to solving social problems, creating the required working conditions, organizing medical services and health improvement, and providing housing.

Together with the Ministry of Health and the Moldovan Health Resort Council, the republic committee implemented a number of measures directed at protecting public health workers during the transition to the new forms of the economy's management. The brigade form of labor organization and wages, work based on mutually advantageous contracts, bonuses, and wages differentiated depending on qualifications, intensity, results, etc. are being widely introduced.

At the same time, sufficient attention is still not being devoted to the demands of medical workers, and particularly to solving wage problems, providing housing and hot food, and improving working conditions and labor protection. Morbidity and industrial injuries and accidents remain at a high level among medical workers.

The congress abolished the republic committee of the medical workers trade union and adopted a decision forming the Central Committee of the Moldovan SSR Public Health Workers Trade Union, it changed the name of the medical

workers trade union to the Moldovan SSR Public Health Workers Trade Union, and it adopted the Charter and program of activity.

#### **Program of Activity of the Moldovan SSR Public Health Workers Trade Union for 1990-1995**

Considering the trends in the changes occurring in economic activity, in the economy, in legislation and in labor relations, and rethinking its place and role in the life of the society, the Moldovan SSR Public Health Workers Trade Union determines its priority objective as protecting the professional, economic and social rights and interests of the sector's workers.

To achieve these objectives the trade union will fight for unity and raise the authority of its movement, it will work actively within the framework of the Moldovan SSR trade union federation and the country's federation of public health worker trade unions, and it will cooperate with state and economic organs and with all public groups working for the social protection of people.

#### **Basic Directions of Activity**

##### **I. In Economic and Social Development**

1. Taking part in the development and implementation of plans for social and economic development of public health and the sanatorium and health resort system, and reinforcing their social orientation, and primarily:

—allocating not less than 10 percent of state capital investments to the construction of social facilities;

—erecting new public health facilities only in integration with housing, with regard for providing departmental housing space to not less than 25 percent of persons working in such facilities;

—increasing allocations and materials for the repair of public health institutions by not less than two to three times with the purpose of meeting public health norms and labor protection norms in operating institutions; creating the conditions for highly productive labor;

—providing all medical school and other students with room in dormitories prior to 1994;

—actively working to utilize available possibilities for providing laborers with housing, and preventing violations in its distribution.

2. Now that the rights of executives of public health institutions and local soviets of people's deputies are being expanded and a transition is being made to the new economic mechanism, efforts are to be concentrated on solving social problems and introducing justified staff sizes, work load norms, and a new approach to paying wages on the basis of end results.

3. Obtaining an increase in wages and salaries of all categories of public health workers up to the average wages for workers in the national economy's productive sectors, with regard for inflation and retention of existing extra payments and allowances in all types of jobs, repealing wage restrictions, paying overtime for work done beyond the monthly working time norm, and providing extra holiday pay, credited to the monthly working time norm, equal to 50 percent of the hourly pay rate; extending the benefits of multishift work to all

public health workers; switching from pay for additional duties to pay for actually worked time, which will provide a possibility for including all wages when calculating pensions and workman's compensation; paying out the full amount of the authorized wage fund, and introducing progressive forms of labor organization and material stimulation in all places.

4. The collective contract must become the most important tool used by trade union organs in carrying out their protective functions. The trade union will work to include measures in the contract directed at solving the collective's immediate social problems, encouraging conscientious work, granting paid additional leaves, reducing the work time of certain workers, providing assistance to large and poor families, and establishing extra pension payments and other benefits for workers, to be covered by assets earned by labor collectives.

Relations between the Moldovan SSR Ministry of Health and the Central Committee of the Moldovan Health Resort Council will be structured on the basis of agreements or contracts as effective instruments for settling labor and wage problems, for selecting the priorities of solving socioeconomic problems, for granting additional benefits not foreseen by law, and for resolving arising conflicts and disagreements.

5. The most important objective of the trade union is to ensure the social protection of working women. A basic line toward lengthening child care leave, ensuring the right to work on a convenient shift schedule, establishing a part-time work day (if so desired), releasing women from harmful work areas and limiting night shift work, preventing unjustified layoffs of working women and so on will be pursued for these purposes.

6. Providing constant assistance and support to orphaned children, students, soldier-internationalists, disaster recovery workers of the Chernobyl Nuclear Power Plant accident, young families and single pensioners in solving material and housing problems, health improvement and so on.

7. In the transition to a market economy, working with the Moldovan SSR Ministry of Health and the Moldovan Health Resort Council to develop and implement a complex of measures to mitigate the negative influence of this process upon the standard of living of laborers, to include a system by which to compensate for price increases, indexing wages, and supporting the constitutional right of each citizen to work in accordance with his specialty and qualifications, and especially in regard to persons near retirement age, women with young children, and young people.

##### **II. In Providing Social Guarantees and Protecting the Rights and Interests of Laborers**

1. The Moldovan SSR Public Health Workers Trade Union will actively utilize its right of legal initiative and expert assessment of draft laws, standards, plans for social and economic development and so on, and submit proposals to take full account of problems troubling workers in public health and in the sanatorium and health resort system. The trade union will defend the legal rights and interests of its members at their place of work, in court and in other state and economic organs and institutions, as well as rights associated with acquiring a profession and upgrading qualifications, with job placement, and with creation of highly productive and safe working conditions.



2. The trade union will take part in the development of the conceptions for development of the republic's public health, for improving its structure, for training and using personnel, and for providing financial and material support. Special attention will be turned in this case to eliminating possible negative social consequences to laborers.

3. Certifying all work stations and working conditions prior to 1 June 1991, and requiring that the results of such certification serve as a basis for correcting all plans and programs having to do with this problem, and increasing expenditures for these purposes.

4. Fully providing all workers with protective and special clothing and personal protective resources; developing proposals on reviewing their supply norms and assortment.

5. The trade union will defend decisions adopted placing public health workers, and primarily women, employed in areas with chemical, physical and biological hazards, and workers serving planned night duty, on the list of occupations and positions bearing the right to extra pension support, and change of wages for working in hazardous conditions when it is impossible to eliminate them because of the special nature of activity.

6. The trade union will work to lengthen leave time to a total of not less than 24 work days for all categories of workers in the sector, and it will insist that the law "On Pension Support to Laborers" must foresee that wages paid to medical workers for additional duties in the same institution are to be included in the amount of earnings upon which to base pension calculations, and that the law must foresee payment of old-age pensions to working pensioners without restrictions.

7. Setting a priority on efforts to ensure full implementation of the additional benefits granted by the Moldovan SSR Council of Ministers Decree No 154 dated 24 May 1991 "On Measures to Hasten Solution of Social Problems of the Republic's Medical Workers" and Decree No 134 dated 8 May 1990 "On Decree No 330 of the USSR Council of Ministers, the AUCCTU and the All-Union Komsomol Central Committee Dated 7 April 1990 'On Additional Measures to Improve the Material and Personal Conditions of Students of Institutions of Higher and Secondary Special Education'."

8. In order to reduce morbidity involving temporary incapacitation, efforts will be concentrated on developing and implementing comprehensive measures directed at improving the organization of public health, medical support and improvement of the health of the sector's workers and their children, as well as of young students, and at reinforcing the material and technical base of health improvement institutions, pioneer camps, athletic, cultural and educational institutions, and young persons' clubs, and development of tourism.

9. The trade union will make an effort to create social funds of economic organs and the trade union to be used to create the material and technical base for improvement of the

health of laborers and their children, and to reduce the cost of food and drugs to especially needy workers.

10. The trade union will support proposals to increase the insurance premiums paid by public health institutions for health improvement, preventive and other purposes to the average of the national economic sectors; to allocate part of the assets obtained from a reduction in morbidity to construction of sanatoriums, preventive treatment hospitals and other health improvement institutions for public health workers.

### III. In Organizing Internal Trade Union and Financial Activity

1. Providing assistance to primary trade union organizations in expanding their independence in adopting decisions and implementing them will be the main direction of activity.

2. Training of trade union staff will be organized with regard to the nature of the trade union activity, the particular features of the medical institutions, and other features.

3. Primary organizations will be left with not less than 70 percent of the total of collected member dues; providing assistance in sensibly using this money on behalf of all members of the trade union will be a special objective.

4. Upon creating a fund for mutual assistance and social development and depositing free assets in the bank, the trade union will implement a program of measures to solve specific social problems, to provide assistance to poor families, orphans, students, pensioners and other needy trade union members, and support acts of charity and mutual assistance in special situations.

5. In order to ensure the legal and social guarantees of its activities, the trade union will support adoption of the law "On the Rights of Moldovan SSR Trade Unions" and other laws affecting the interests of the trade union's members.

6. The trade union will participate in the nomination of candidates for soviets of people's deputies at all levels, and through them it will pursue a line toward protecting the legal rights and interests of trade union members in government organs.

7. In order that trade union members and the republic's population would be more fully informed about the objectives being pursued by the trade union, an information system will be activated and the possibilities of trade union publications, television, radio broadcasting and other mass media channels will be utilized.

Solution of the listed problems requires unification of effort, consolidation and active participation in these efforts by all primary trade union organizations and members of the sector's trade union, business executives and medical personnel serving as people's deputies, and assistance from the Moldovan and the country's trade union federations.

The Charter of the Moldovan SSR Public Health Workers Trade Union will be published in the journal's first 1991 issue. ©COPYRIGHT: Zdravookhraneniye 1990

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